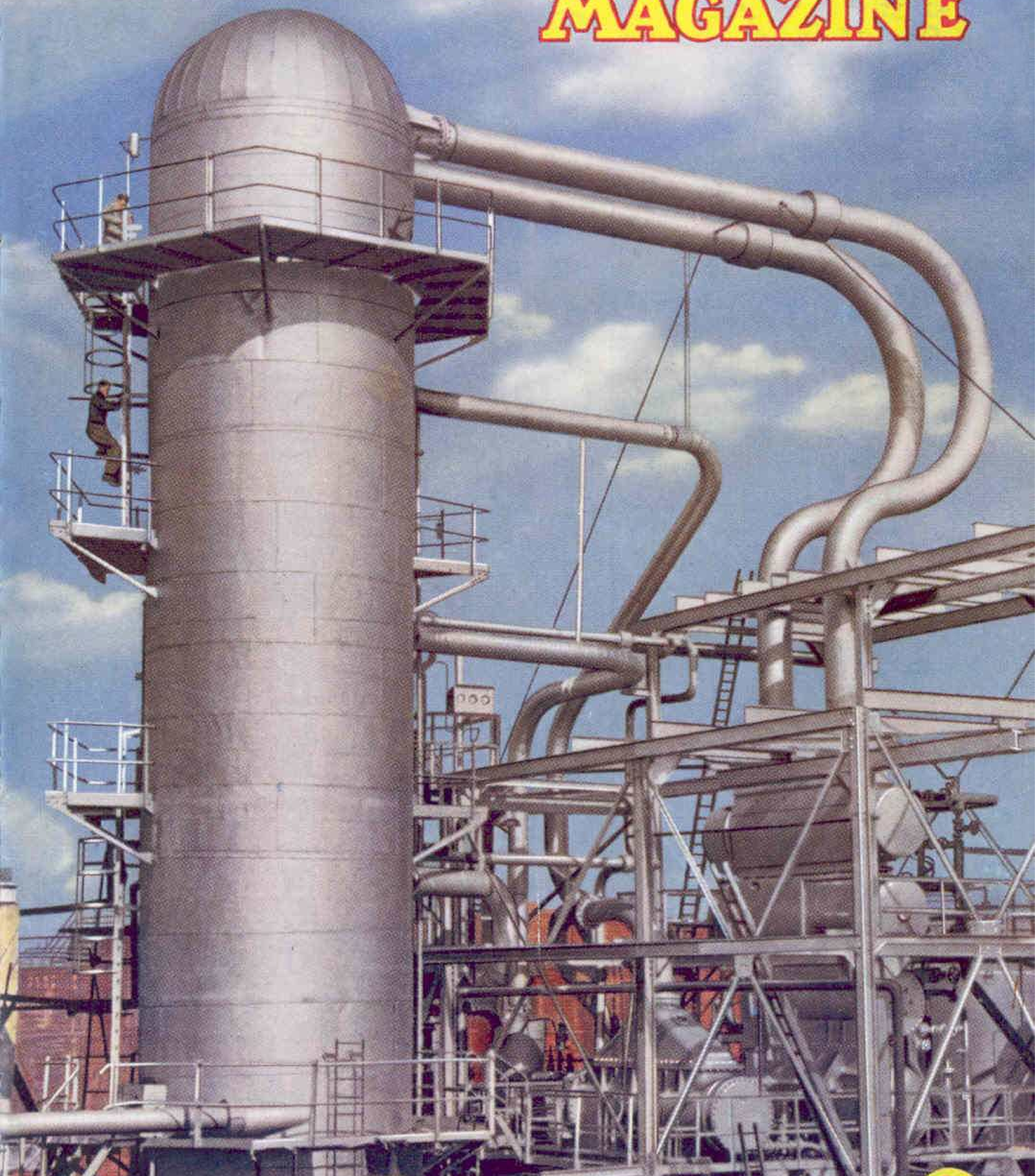
VOL. XXXIII. No. 2 FEBRUARY 1948

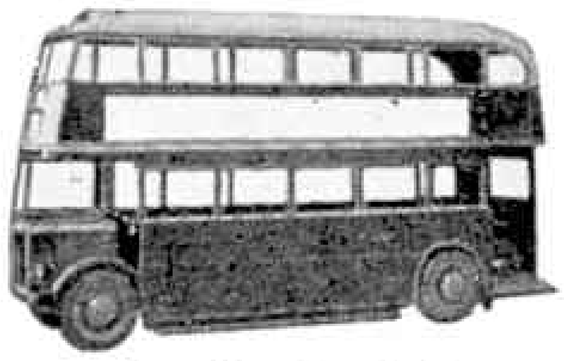
MECCANO MAGAZINE



OIL FOR BRITAIN

6D.

DINKY TOYS



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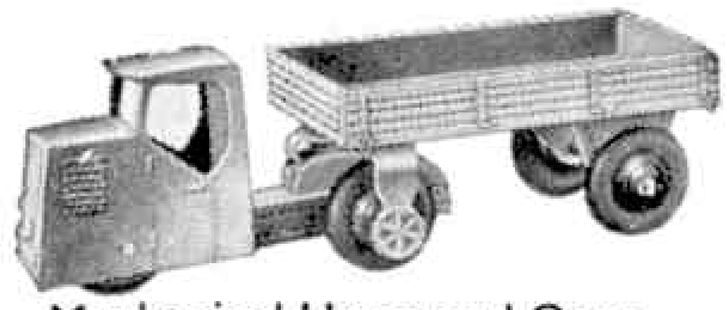

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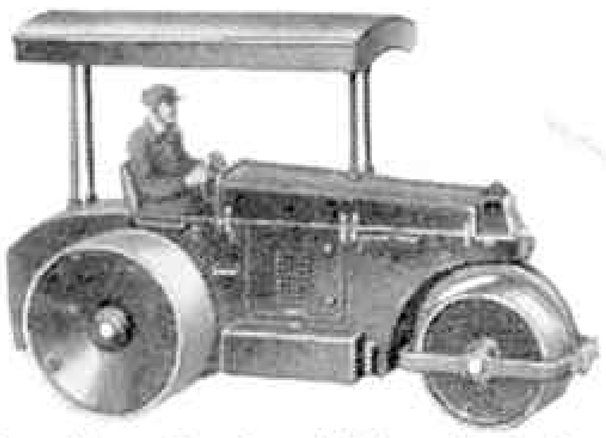

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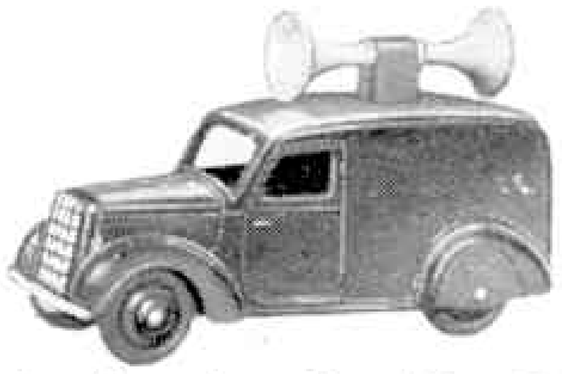

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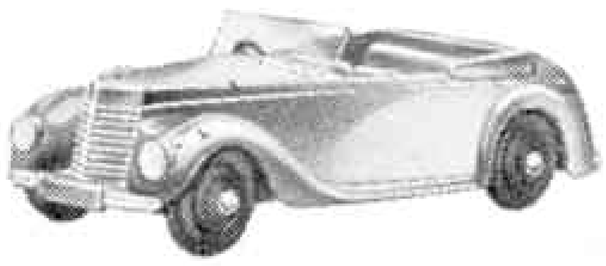

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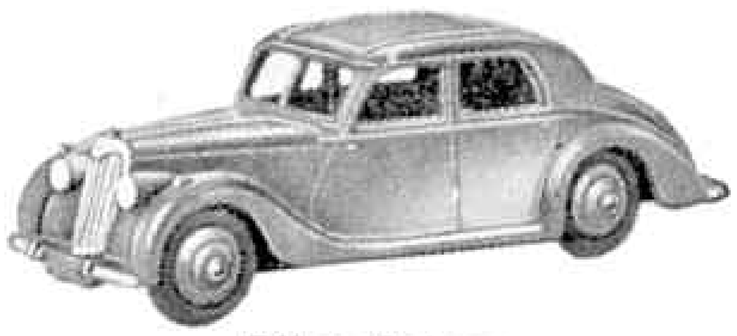

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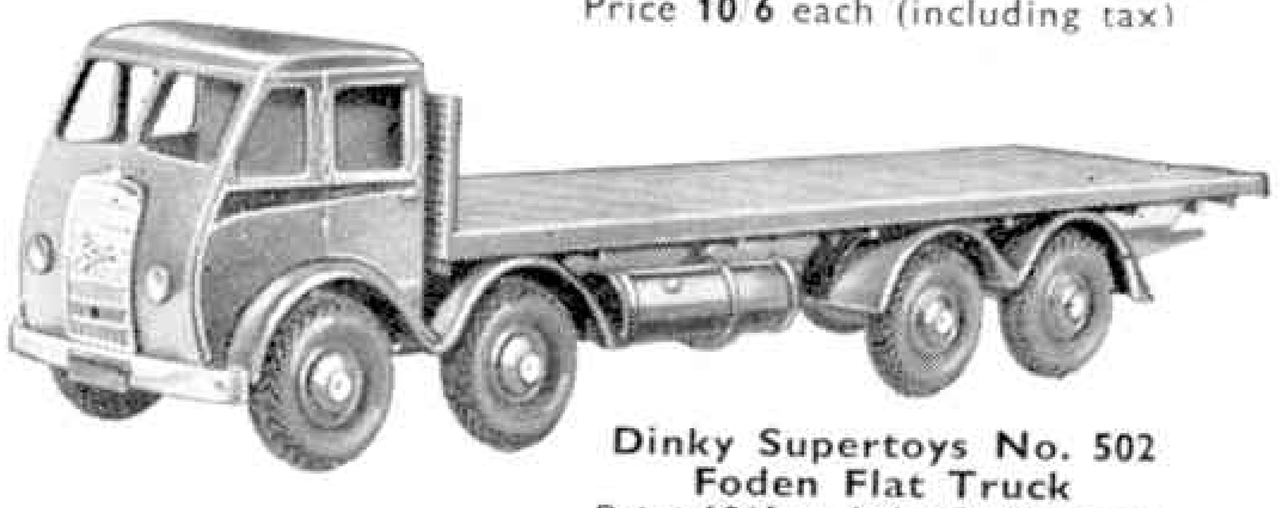

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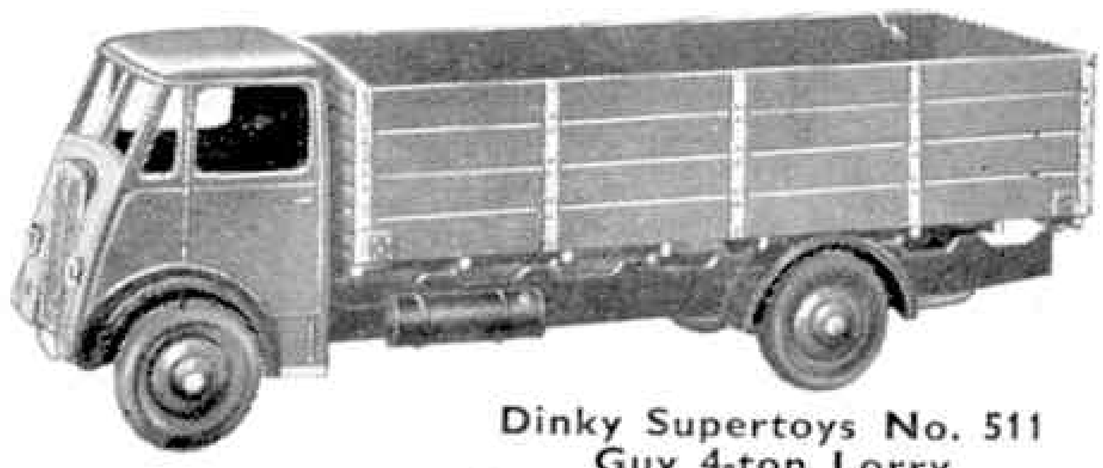

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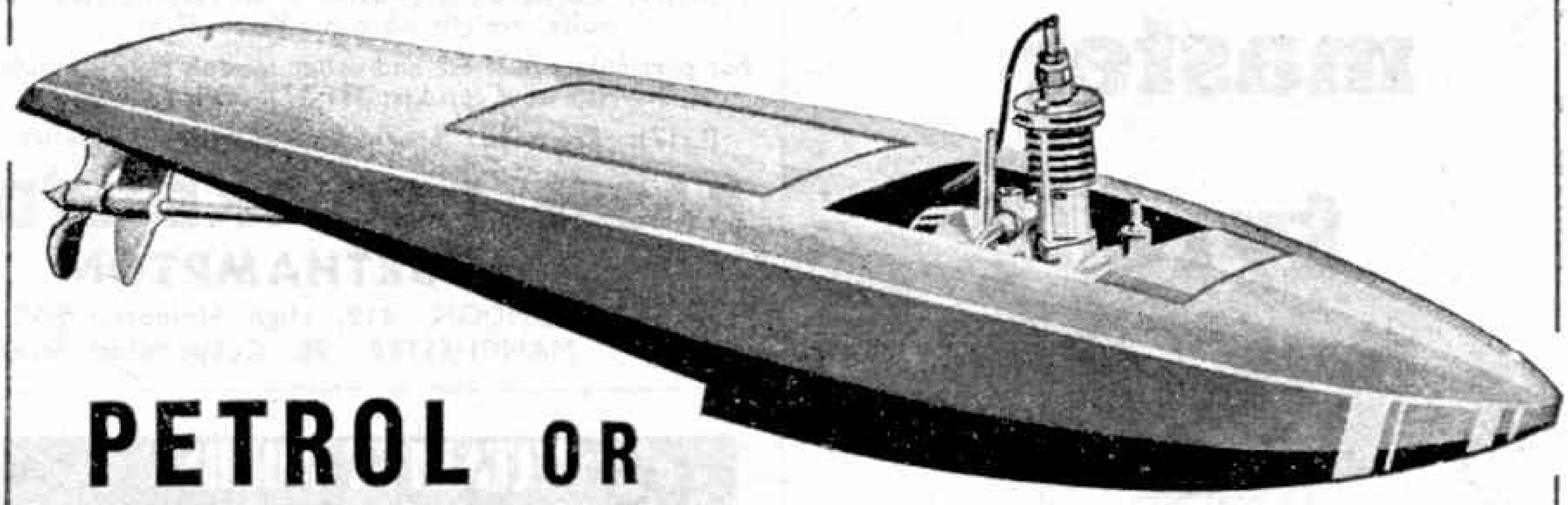

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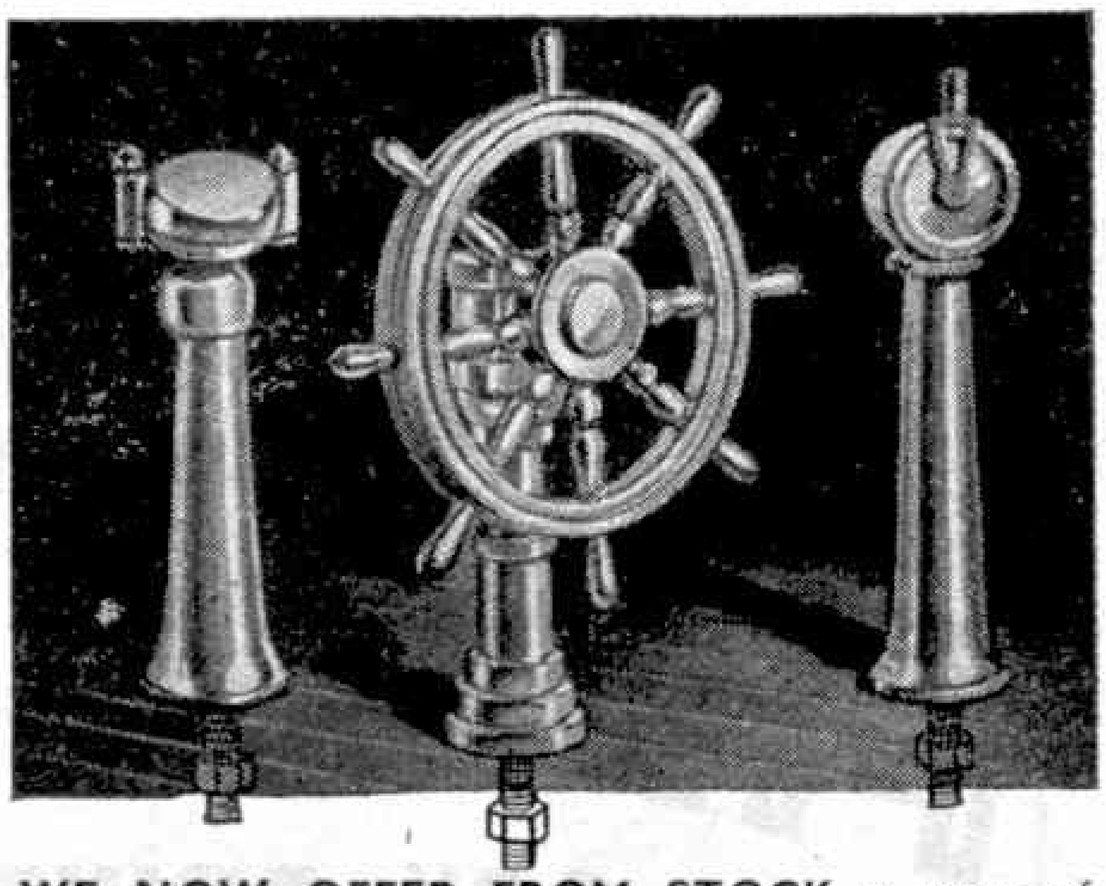

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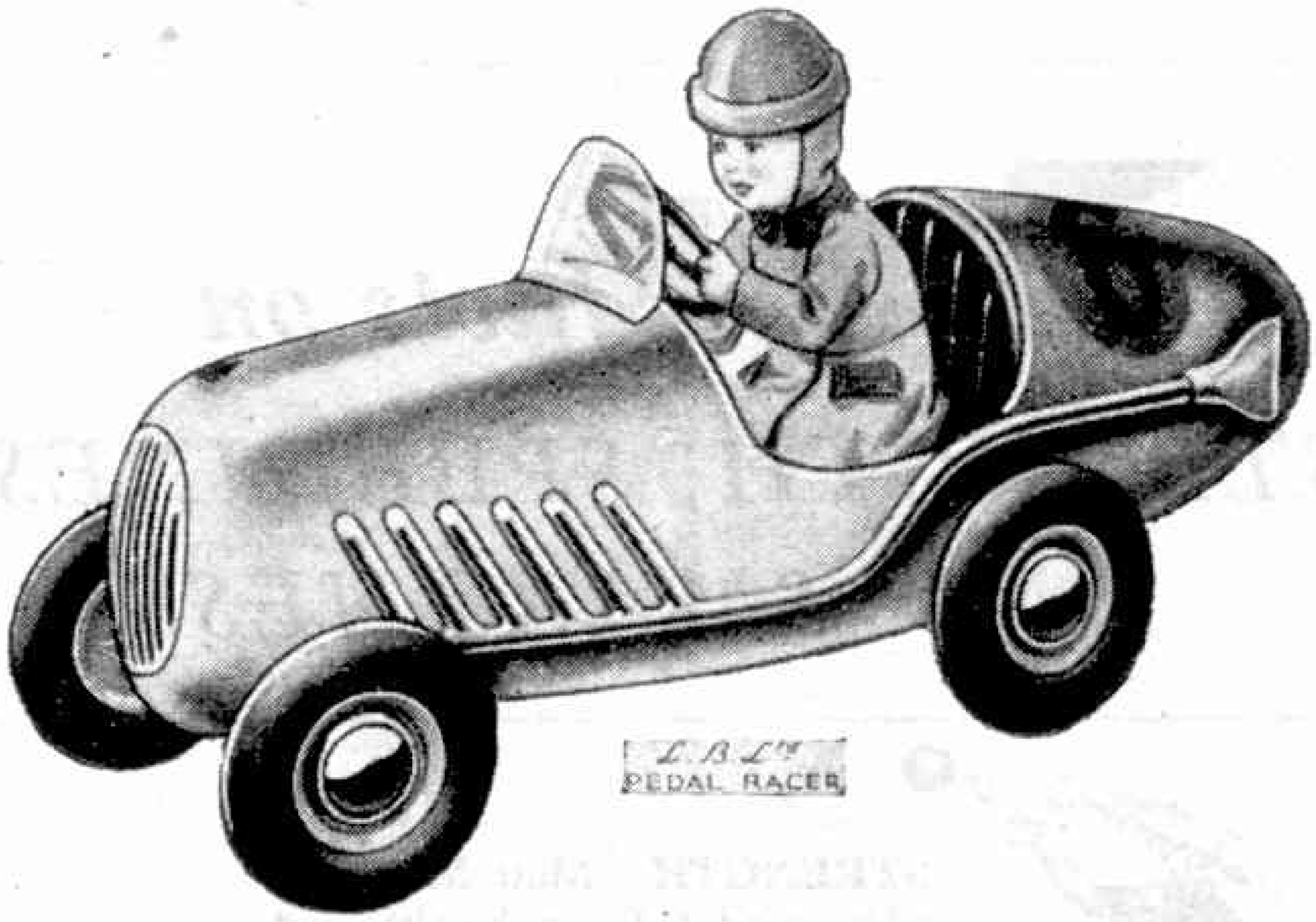

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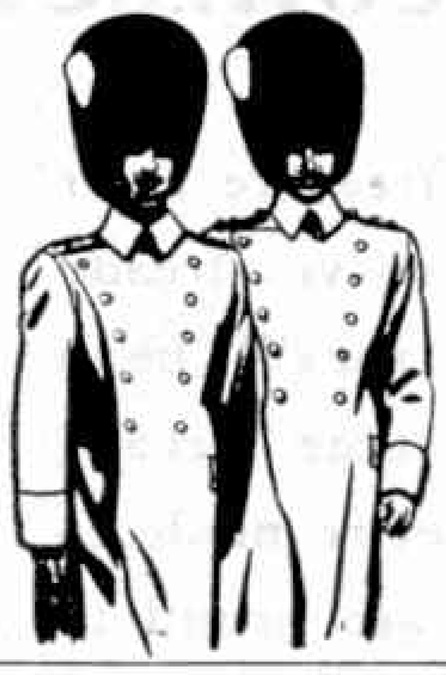

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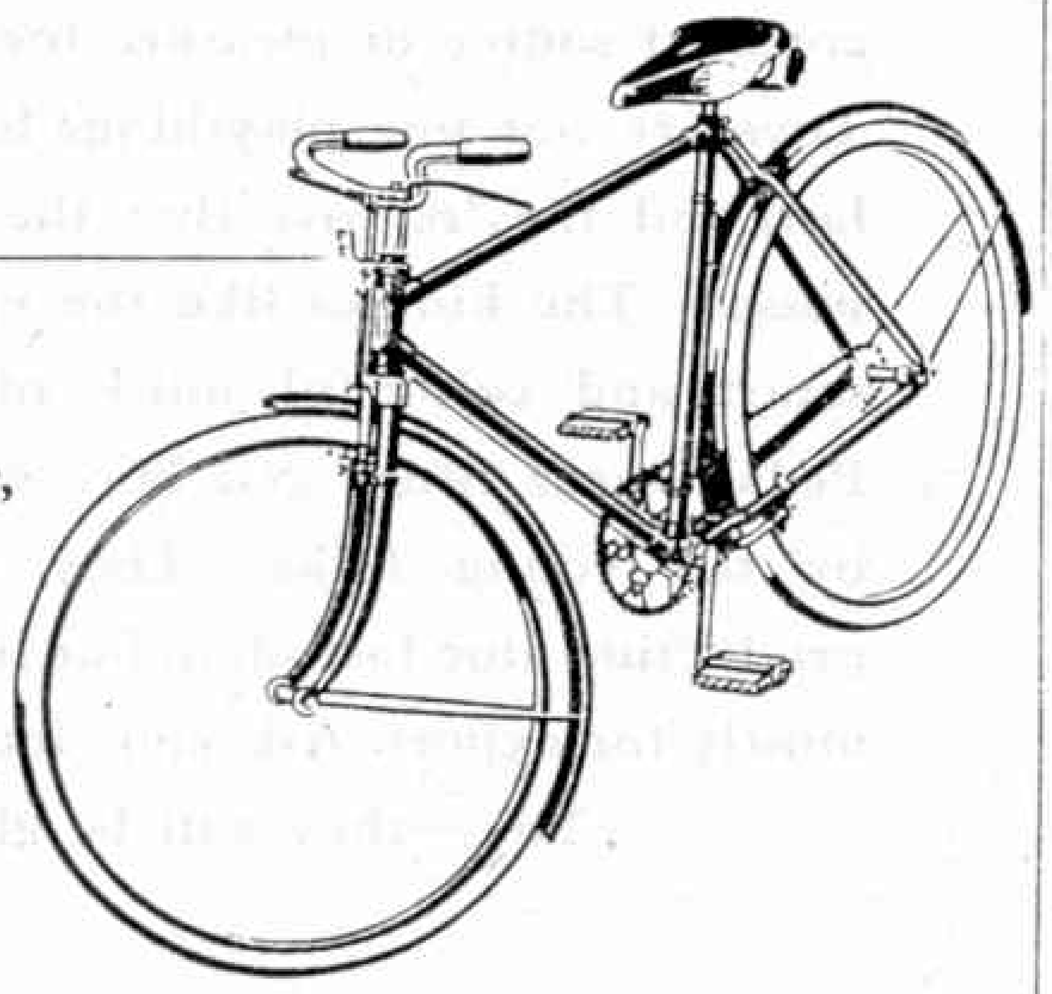

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MECCANO MAGAZINE

Editorial Office:
Binns Road
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England

Vol. XXXIII
No. 2
February 1948

With the Editor

Solving the Paper Problem

I was really astonished at the extent of the response to my invitation in the December *"M.M."* for suggestions for dealing with the problem set by the reduction of paper for the Magazine. I had expected that many readers would suggest the dropping of one or more of the regular features, but to my surprise only one reader made such a proposal. This seems to indicate that, although readers have their own favourite subjects, they are sufficiently interested in other subjects to wish to retain the monthly notes. A careful check of all the post-cards and letters received shows that by far the majority of writers favour the inclusion of all the regular features, with a reduction from two pages to one page where necessary, this reduction to apply to each feature in turn. I am in full agreement with this plan, and I will try it during the next few issues. It may turn out to be necessary to omit some feature entirely from a particular issue, but I will avoid this if at all possible.

A few readers suggested that the Magazine should be issued in alternate months. This would certainly allow each issue to be a good size, but I am sure that most readers would object to having to wait two months for their next *"M.M."* Another proposal was that I should make greater use of the small type, but I am not in favour of this. I have to use it for such items as *"Railway Notes"* and *"Air News,"* but for general articles the larger type is much more readable. As a matter of fact I should like to drop the small type altogether, as I find that its use makes proof-reading a very trying business.

One correspondent startled me by suggesting that there would be a lot more room if all pictures were omitted. Wild horses will not make me divulge the name and address of this bright lad, as I am sure that he would be promptly visited by a great crowd of indignant readers and destroyed utterly.

I thank readers who have written to me on this matter. I hope they will all watch the progress of the *"M.M."* during the next few months, and then let me know whether they agree with the changes that have been made.

* * * *

A notable visitor last month to the Meccano Works was Lord Baden-Powell, son of the founder of the Boy Scout Movement. Accompanied by his young son, he made a complete tour of the works, and watched with keen interest the various stages in the making of Meccano products.

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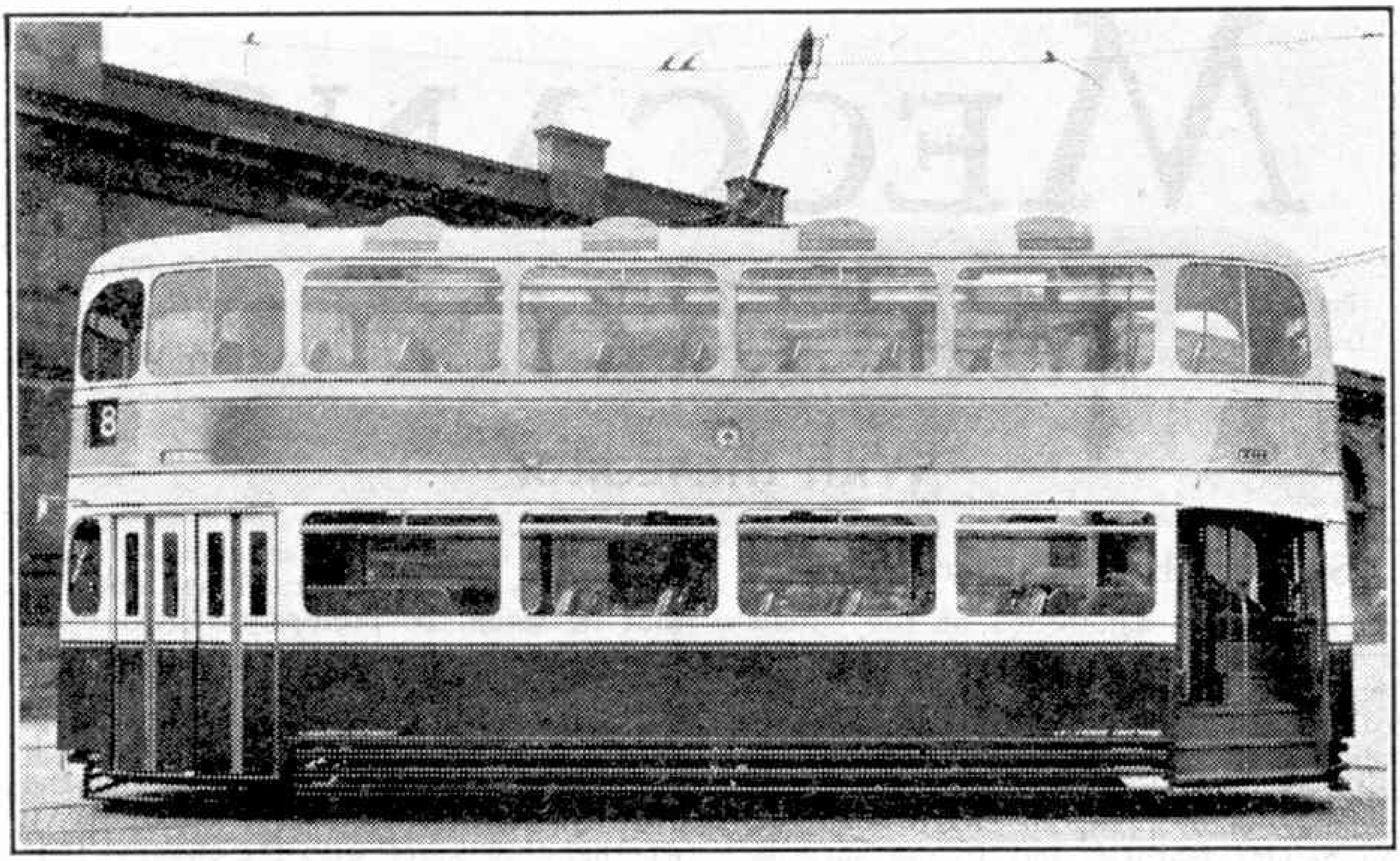


A Luxury Tramcar

Glasgow's Experimental Vehicle

ALTHOUGH we appear to be living in the age of the motor bus, and in many cities and towns indeed motor vehicles have entirely replaced tramcars, yet the latter are not necessarily doomed to extinction. The motor bus certainly has many advantages. It is not confined to a fixed track, but can thread its way readily through crowded streets. Its route can be varied easily as required, as no elaborate installation of tracks and overhead wires is required for it; and the breakdown of one bus does not involve holding up all those that come after it, as is the case within certain limits with the tramcar.

The older method of street transport has not by any means been proved to be out of date, however. Many of the objections that have been raised to it are based on experiences with old vehicles, and recent determined efforts to design tramcars of modern construction that provide speedier and more comfortable travel than in the past may yet lead to a change in policy.

The beginning of this development came from the United States, where what is known as the P.C.C. car has been introduced. These initials mean "Presidents' Conference Committee," and the new type of tramcar denoted by this name is the result of the joint efforts of the Presidents of the leading street tramway companies. In 1929 they realised that the tramcar of that day was no longer adequate for the swift and comfortable movement of large numbers of people. After exhaustive tests and experiments the first of the new street cars, to use the American name, was delivered in 1936. It was a super-streamlined product. Good springing and wheels with rubber cushions, the lavish use of rubber generally to provide for smooth and easy riding, and the introduction of control equipment that gave rapid acceleration and braking in easy stages to avoid jerkiness, were notable improvements; and double doors, low steps and glareless illumination, with heating and ventilating systems, helped to give a vehicle that was swift, safe and comfortable.

Many improvements have now been made, and to-day great numbers of P.C.C. tramcars are in operation in Chicago, Philadelphia and other large cities in the United States, as well as in Toronto in Canada. In this country Blackpool and Glasgow have provided outstanding examples of improvement in tramcar design and construction by introducing vehicles

with characteristic P.C.C. features.

The latest British example of the P.C.C. type of tramcar is an experimental vehicle that has been completed in Glasgow. This has a front entrance and a separate rear exit in order to speed up loading and unloading. Normally such an arrangement would have meant a change in the stairways to the upper saloons, for instead of the spiral stairway on each platform, a feature of Glasgow tramcars that has proved to be very safe, straight stairs within the body would have been necessary. This would have reduced the number of seats. To avoid this a tramcar that can be driven from one end only has been designed. This is suitable for any of several circular routes operated in the city, and with little alterations can be used also on other lines.

The new tramcar is shown in the illustrations on these pages. It has been designed to try out the most modern tramway electrical equipment made in this country. It follows the lines of the P.C.C. car and is expected to show a higher acceleration, with smooth starting and stopping, than has ever before been achieved in Great Britain.

The new vehicle has a seating capacity of 34 in the lower saloon and 38 in the upper saloon, making a total of 72. Every effort has been made to obtain a pleasing and artistic effect with the interior and exterior decoration. The bottom panels of the body are royal blue in colour, window frames sky blue and the upper sheeting pale blue. Materials that are easily cleaned are being used for interior coverings.

The seats are made of steel tubular frames fitted with spring cushions. Those in the upper saloon are trimmed with leather, and moquette with leather bandings is used for those in the lower saloon. All are of the non-reversible type, and there is ample leg room between the seats.

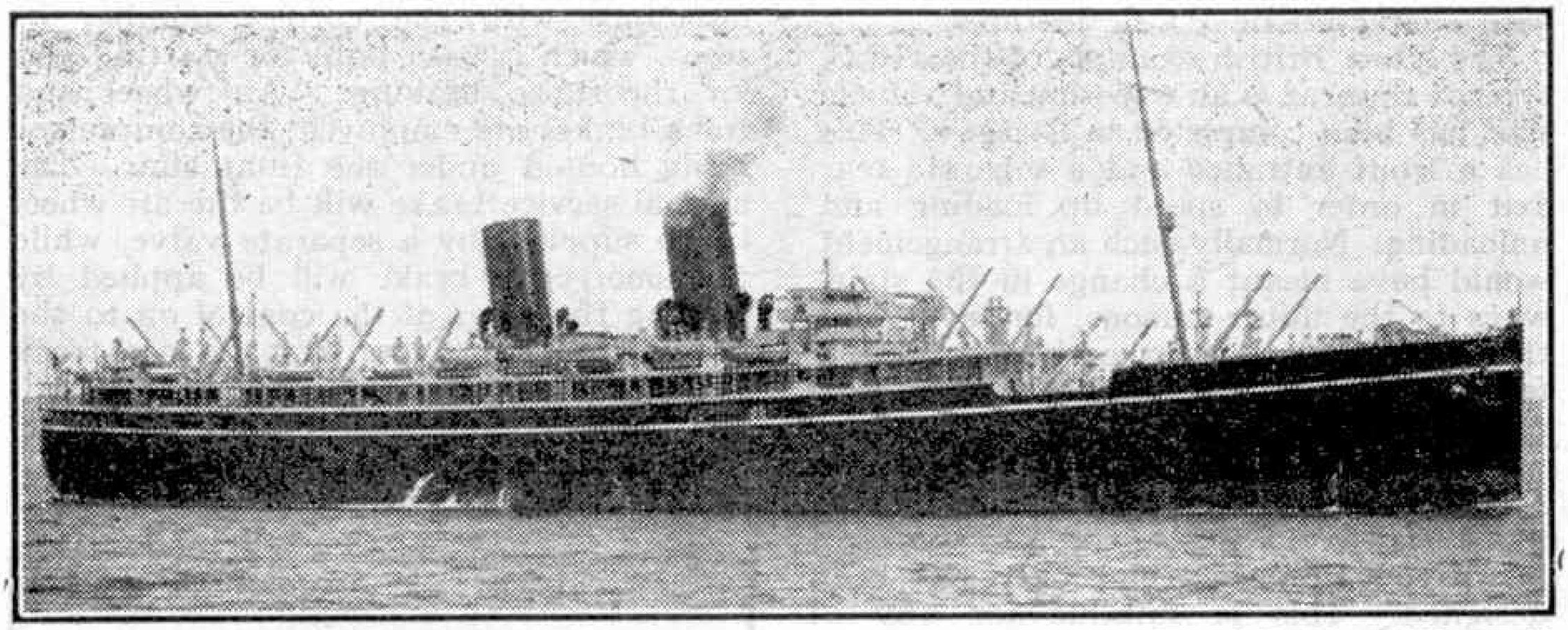
A special feature of the car is the use of an air-operated double sliding entrance door, under the control of the driver, which can only be opened when the vehicle comes to rest. It is hoped in this way to reduce the number of platform accidents, and rubber cushions fitted to the edges of the door will prove a further safeguard. Lighting in both saloons is by daylight fluoerscent lamps; there are ten tubes, each 4 ft. long, in the lower saloon, and ten 3 ft. long in the upper saloon.

The electrical equipment consists of four light-weight high speed motors, each of 41 h.p., and these are controlled by a resistance with the correct number of steps, which is used both for starting and for rheostatic braking. Air wheel and track brakes are employed, the compressor being housed under the front stair. The normal service brake will be the air wheel brake supplied by a separate valve, while the emergency brake will be applied by moving the lever of the control on to the brake notches, giving first an air track brake, the air wheel brake being released, and then a combination of air track brake, magnetic track brake and dynamic braking.

The drive is by means of a worm and

Front view of the new experimental tramcar now in service in Glasgow. A side view is shown on the opposite page. Photographs by courtesy of E. R. L. Fitzpayne, General Manager, Glasgow Corporation Transport.

worm wheel, a departure that will reduce transmission noise. The frame of the bogie is on the inside of the wheels, so that resilient road wheels of the type used on American P.C.C. cars can be installed if these prove successful in trials that are now being carried on by the Glasgow Transport Department. These wheels will not only eliminate noise, but also will allow a change to be made readily in the depot, or even in the street if this should become necessary. As it will be some time before full information is obtained from the trials now in progress the new car has been fitted with standard wheels.



P. and O. Liner "Mooltan."

Some Interesting P. and O. Liners

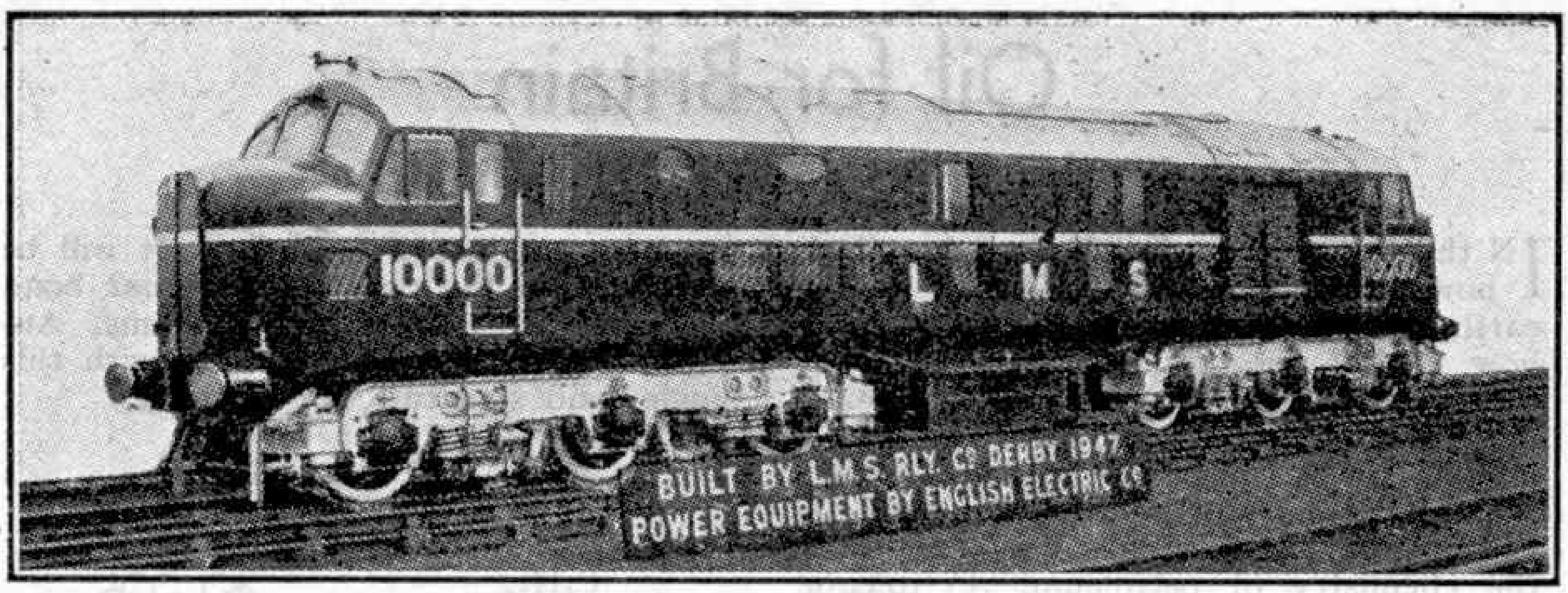
By Denis Rebbeck, M.A., M.Sc., B.Litt., M.I.N.A.

THIS year the present P. and O. liner *"Mooltan"* will have been in service for a quarter of a century; this is a fine tribute to the builders of this famous old ship, Harland and Wolff Ltd. of Belfast. The *"Mooltan"* is one of two sister ships (the other being the *"Maloja"*) which sailed from the Belfast shipyards in 1923. The gross tonnage of each vessel is 20,952 and the dimensions are as follows: length 600.8 ft., breadth 73.4 ft., depth 48.6 ft. A speed of 17 knots is obtained with twin screw quadruple expansion steam engines.

These two ships have very pleasing lines, as will be seen from the photograph, and their commissioning in 1923 permitted the P. and O. company to carry out its scheduled service to the East. As constructed, they were built up to the limits of the economical possibilities of the trade and the capabilities of the Suez Canal. An interesting point about the *"Mooltan"* and her sister at the time of completion was that the ships had quadruple expansion engines instead of steam turbines, so as to ensure absolute reliability. Bauer-Wach exhaust turbines were added to the machinery installation at a later date and the speed of the ships was thereby improved. These "old timers" have always been firm favourites.

We are apt to forget such ships as the *"Narkunda"* one of the most famous of the P. and O. liners of the immediate post-1914-18 war period. The *"Narkunda"* was also a twin screw vessel, driven by quadruple expansion steam engines, and had a gross tonnage of 16,572 with a length of 581.4 ft., 69.4 ft. breadth and 27.7 ft. depth. She was the first three-funnelled ship in the P. and O. service. Though launched in 1918, her completion was delayed by the Government and she was not ready for service until 1920. Some wags in the Belfast shipyards remarked at the time when the design of this ship was being altered by order of the Government on several occasions that the *"Narkunda"* had been everything except a submarine! This three funneller, which became a great favourite, was sunk during the Second World War.

A great number of vessels in the P. and O. fleet have been built by Harland and Wolff Ltd.; we recall the *"Rosetta"* which, completed in 1880, was the first P. and O. vessel to be built in Ireland, and which started a long connection with the Belfast shipyards. Other ships which come to mind, and which were all built in Belfast, are the *"Marmora"* and *"Macedonia,"* which introduced in 1903 and 1904 respectively the quadruple expansion engine into the P. and O. service, and a very remarkable ship, the *"Razmak"* (1925). The *"Razmak"* was built for the Aden-Bombay shuttle service. She was only of 10,857 gross tons, but had a speed of well over 18 knots, and broke a long-standing record between Bombay and Aden. When the reconstruction of the P. and O. services rendered the shuttle service unnecessary she was sold to a subsidiary company and immediately broke the transpacific record on the New Zealand-San Francisco route.



Britain's First Main Line Diesel

MID-DECEMBER 1947 saw the first public appearance of Britain's first main line diesel locomotive, when L.M.S. No. 10000, illustrated above, was shown at Euston Station. This latest development in main line motive power, the introduction of which was foreshadowed in the "*M.M.*" last June, thus appeared in time to mark the close of the grouping era and the transfer of the main line systems to national ownership.

No. 10000 is a compact assembly of mechanical and electrical equipment forming together a 1,600 h.p. motive power unit over 60 ft. long and weighing over 120 tons. The L.M.S. Chief Mechanical Engineer, Mr. H. G. Ivatt, has been responsible for its general design, while the English Electric Company produced the diesel engine and electrical appliances. The power equipment of the locomotive consists of four main groups. There is the power unit, including the diesel engine and the direct-coupled main generator that is driven by it. Power from the generator is transmitted to the driving wheels by means of six traction motors, one to each axle of the two special six-wheeled bogies on which the locomotive runs. Then there is the control gear, and finally the auxiliary equipment.

The engine is a 16-cylinder Vee-type four-cycle, turbo-charged unit specially designed and developed for rail traction service, and the governing and control gear has been arranged to facilitate complete remote control. It is started by using the main generator as a motor, on current supplied from batteries; the electrical circuit cannot be completed until pressure has been built up in the engine lubricating system.

A driver's cab is provided at each end of the locomotive and in each cab is mounted a master controller. This includes the main control handle, the reverser lever, and the master switch for starting and stopping the diesel engine. After having set the master switch and reverser, these are then left untouched, and the driver has full control of the locomotive's speed and power in a single main control handle.

Adjustable cushioned seats are provided, and the fittings include windscreen wipers, with an arrangement for washing windows, and sanding and horn valves. A "dead-man's" treadle is fitted. De-frosters and sun blinds are provided, and there are two electric heaters alongside each seat. Dashboards with indirect lighting to the various instruments give the crew information on the working of the engine and equipment. Warning lamps are also fitted, to give indication of anything untoward happening and enabling the crew to take necessary action. A passage-way gives access throughout the locomotive.

The assembly of No. 10000 was carried out in a new workshop at Derby, the first of its kind to be assembled by a British railway company exclusively for the construction and repair of diesel and diesel-electric locomotives. The power unit was erected and tested at the English Electric Company's Works at Rugby and taken to Derby complete. The new locomotive is designed to work either independently, or, coupled to a second unit, to form a 3,200 H.P. locomotive capable of working the heaviest long-distance expresses. When working together the two locomotives are controlled as one unit.

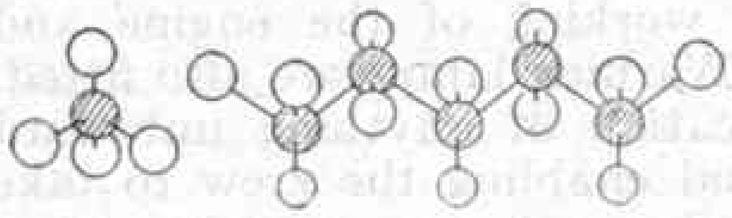
This information, with the photograph reproduced, were supplied by the former L.M.S.

Oil for Britain

II. The Principles of Oil Refining

IN the first of these articles, we described how crude petroleum is formed in the earth, the history of its discovery, and how, to-day, the liquid is recovered from the ground and stored, before being refined. We shall now deal with the refining process, and take, as an example, the operation of an oil refinery here, in Britain. But first, we must briefly consider the chemistry of petroleum. Petroleum consists mainly of a mixture of liquid hydrocarbons: molecules made up of hydrogen and carbon atoms. The remainder of the constituents (such as molecules containing oxygen or sulphur atoms) are regarded as impurities. Carbon and hydrogen are rather peculiar atoms because they combine in such a large variety of patterns. Many thousands of quite different hydrocarbon molecules have been discovered, and it is certain that many thousands more have yet to be isolated.

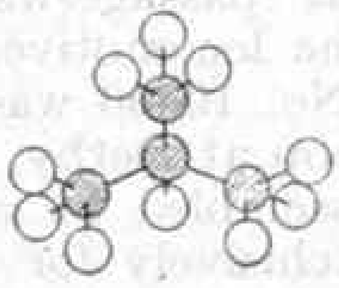
Chemists have developed a method of illustrating the way in which hydrogen and carbon atoms behave. According to this representation, the hydrogen and carbon atoms in hydrocarbon molecules are connected by "bonds" so that four bonds always connect with each carbon atom and one bond with each hydrogen atom—like this:



Black = carbon

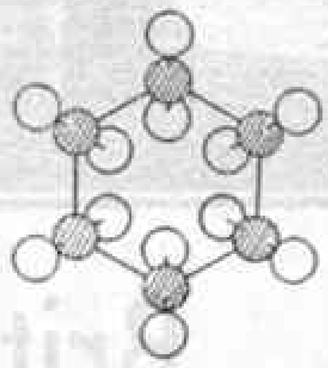
White = hydrogen

— = bond



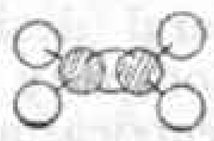
It will be seen that the four bonds project from each carbon atom in a symmetrical way—each bond making the same angle with all the others. Also, a little study will show the reader that there must be a particular number of hydrogen atoms to each carbon atom in molecules of the form illustrated. In fact, the number of hydrogen atoms must be two more than twice the number of carbon atoms. Hydrocarbon molecules to which this rule applies are called saturated, straight, or branched-chain hydrocarbons or, more commonly—*paraffins*. It will be seen that, in the paraffins, only *one* bond connects each pair of carbon atoms. Another formation is also possible with this single-bond structure, for example:

Cyclo-hexane
C_6H_{12}

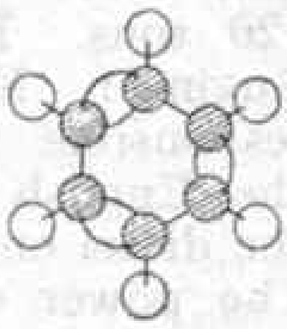


the saturated closed-chain hydrocarbons (or *cyclo-paraffins*). In these the number of hydrogen atoms must be twice the number of carbon atoms. Hydrocarbons of this form are usually called *naphthenes*. Naphthenic and paraffinic are terms used constantly when discussing petroleum products. Therefore, even at the risk of boring the reader, we are bound to describe hydrocarbon patterns rather carefully.

Unsaturated molecules are those which contain fewer hydrogen atoms than are required for saturation so that one or more pairs of carbon atoms are connected by double or triple bonds. They may be either *straight chain*

like this 
(ethylene)

or *cyclic*

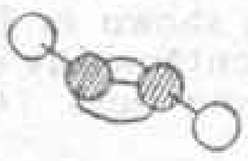

(benzene)

It will be seen that, while the bonds connecting the carbon atoms have to be distorted slightly to form the naphthenes, they have to be distorted very considerably to form the double bond structures pictured above. The degree of distortion of the bonds in a hydrocarbon is a measure of its instability or readiness to react with other compounds, and we can see from their structures that ethylene and benzene will be much less stable than, say, cyclohexane or any of the paraffins.

Hydrocarbons whose structure includes one or more unsaturated cyclic molecules (or *benzene rings*) are termed *aromatics*.

We have now mastered the three most important terms in petroleum chemistry: *paraffins*, *naphthenes* and *aromatics*. For those who are fond of technical names we

give three more commonly used terms: *olefines*, unsaturated chain hydrocarbons with *one double* bond; *di-olefines*, unsaturated chain hydrocarbons with *two double* bonds and *acetylenes*, unsaturated chain hydrocarbons with one *triple* bond,

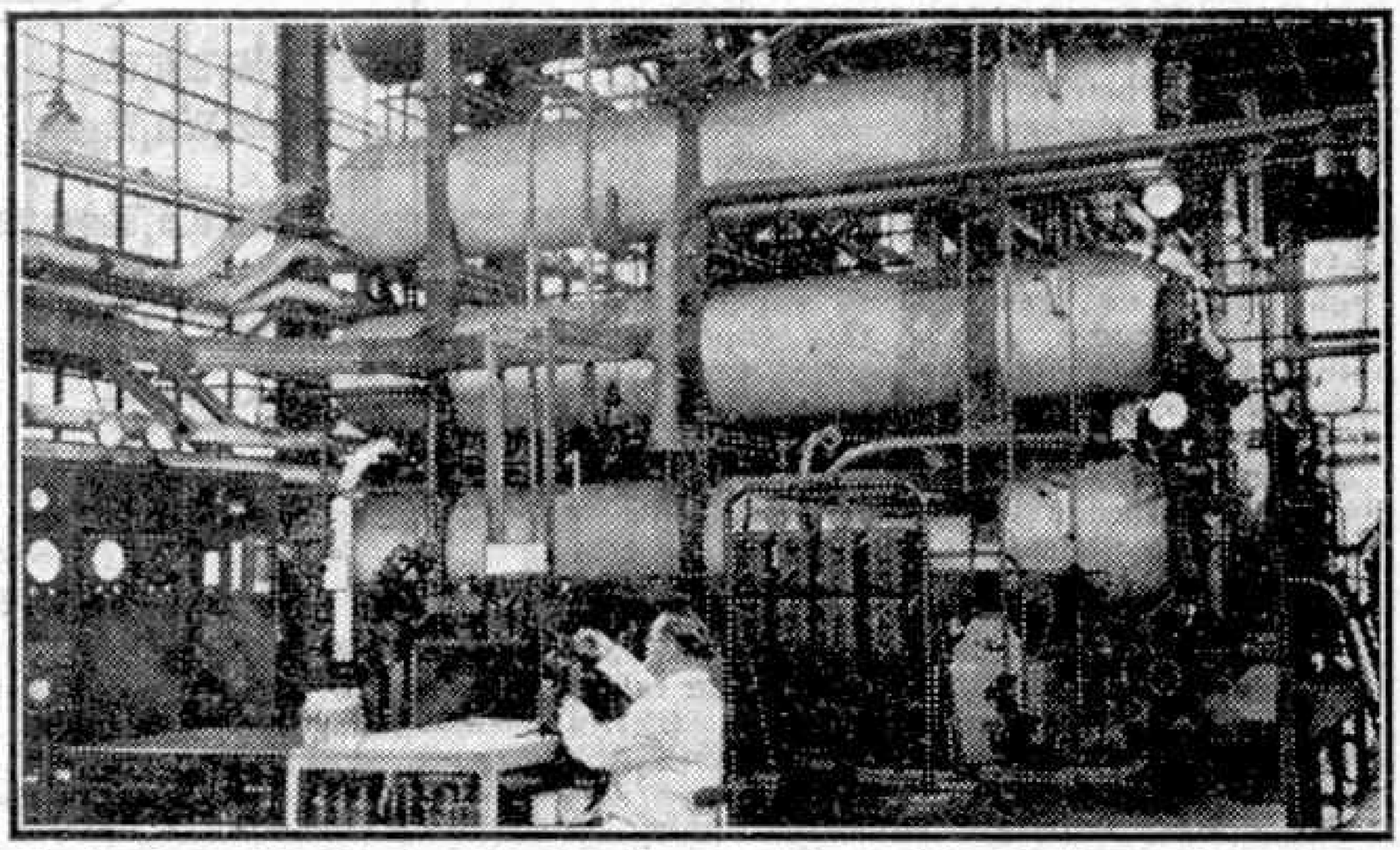


like acetylene itself. Acetylene, as might be expected from the distortion of the bonds, is violently unstable. Spectacular precautions—deep pits, blast walls and so on—must be taken when experimenting with it. The tremendous energy released when acetylene burns in oxygen is utilised in oxy-acetylene welding.

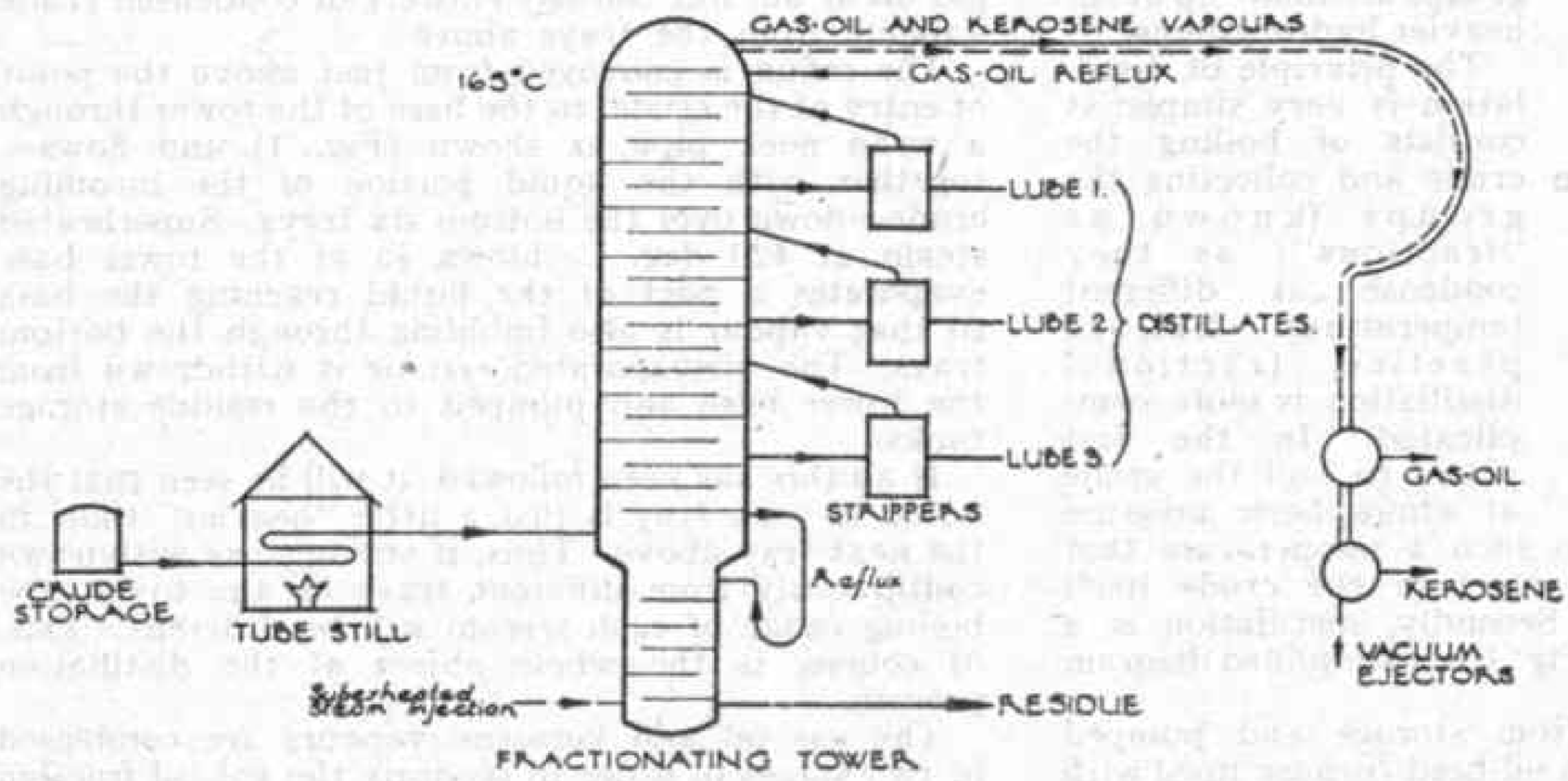
It should be remembered that this "picturisation" of hydrocarbon molecules in terms of spheres connected by "bonds" does not *explain* anything; it just represents the behaviour of hydrocarbon molecules in a way that is systematic and easy to follow.

Crude petroleum consists of a mixture of many hundreds of liquid paraffins, naphthenes and aromatics. The purpose of refining is to sort this mixture into groups so that each group has the properties required of the finished product. What properties are specified for refined petroleum products? Very briefly, they include:

i. Specific gravity ("heaviness").
ii. Viscosity (ease of flowing at a given temperature).
iii. Boiling range at a given pressure. (This is the temperature range above which all the hydrocarbons in the mixture boil, and below which none of them boils, at the given pressure. Most readers will know, of course, that the boiling point of a liquid depends upon pressure).
iv. Flash point (the temperature at which the liquid begins to give off inflammable vapour).
v. Colour. (This is of importance in white oils, but we know to-day that the colour of a lubricating oil bears little relation to its quality).
vi. Stability (resistance to chemical reaction with other elements such as oxygen or metals).
vii. Aromaticity (percentage of aromatic compounds in the mixture).
viii. "Oiliness" about which even to-day a great deal remains to be discovered).



Part of combined solvent extraction and dewaxing plant, showing extract settling tanks with level indicating lights. Manchester Oil Refinery Ltd.



FLOW SCHEME OF VACUUM DISTILLATION UNIT.
MANCHESTER OIL REFINERY LTD.

Fig. 1.

Crude petroleum, being such a diverse mixture is not really suitable for any particular application until refined. It is not

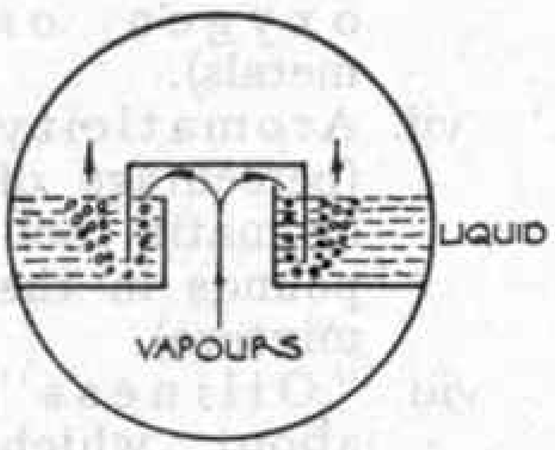
viscous enough, too inflammable and too reactive to use as lubricating oil. It is too viscous, not sufficiently inflammable and contains far too many high boiling constituents to use as petrol or paraffin. It is, among other things, too aromatic to use for medicine (such as medicinal liquid paraffin) or transformer oils. So it has to be refined.

In the industry's early days only a comparatively small part of crude petroleum could be put to good use, so refineries were built near the oil wells to avoid unnecessary transportation of waste constituents over long distances. To-day, over 95 per cent. of crude is made into valuable products and it is economic to construct refineries near consuming areas. For instance, the designers of Manchester Oil Refinery Ltd.—known popularly as M.O.R.—were amongst the first to realise the advantages of locating a refinery in the heart of industrial Britain. The successful development and operation of the plant since 1938 is a tribute to enterprise and engineering teamwork.

The refinery is located on the Ship Canal about six miles west of Manchester. Tankers from overseas berth at the refinery wharf and discharge their cargoes of crude petroleum direct into the storage tanks. As Ship Canal regulations do not allow large tankers to carry crude with a flash point of less than 73 deg. F., the crudes used by M.O.R. must contain only a very small portion of "light ends," *i.e.*, gasoline and vapourising oil. Some crudes satisfy this condition naturally, but others have to be "topped" overseas (the light ends being boiled off by atmospheric distillation).

The refinery was designed primarily to produce high-grade lubricating oils, transformer oils, technical white oils, medicinal liquid paraffin (quite different from paraffin oil or kerosene) and certain oil products. There is also a small yield of kerosene (paraffin) and gas oil from the light ends of the crude. The refinery was not designed to produce gasoline (petrol): the production of petrol will be dealt with in a later article of this series.

The crude discharged from the tanker into the refinery storage tanks consists, then, of a mixture of liquid hydrocarbons and some impurities. The first refining process is distillation: sorting the mixture into groups according to boiling range. Chemically, the effect is to sort the hydrocarbon molecules out according to weight because the light (small) molecules boil at lower temperature than the large (heavy) molecules. Physically, the effect is very roughly to sort the crude according to viscosity because in general the more viscous groups are made up of the heavier hydrocarbons.



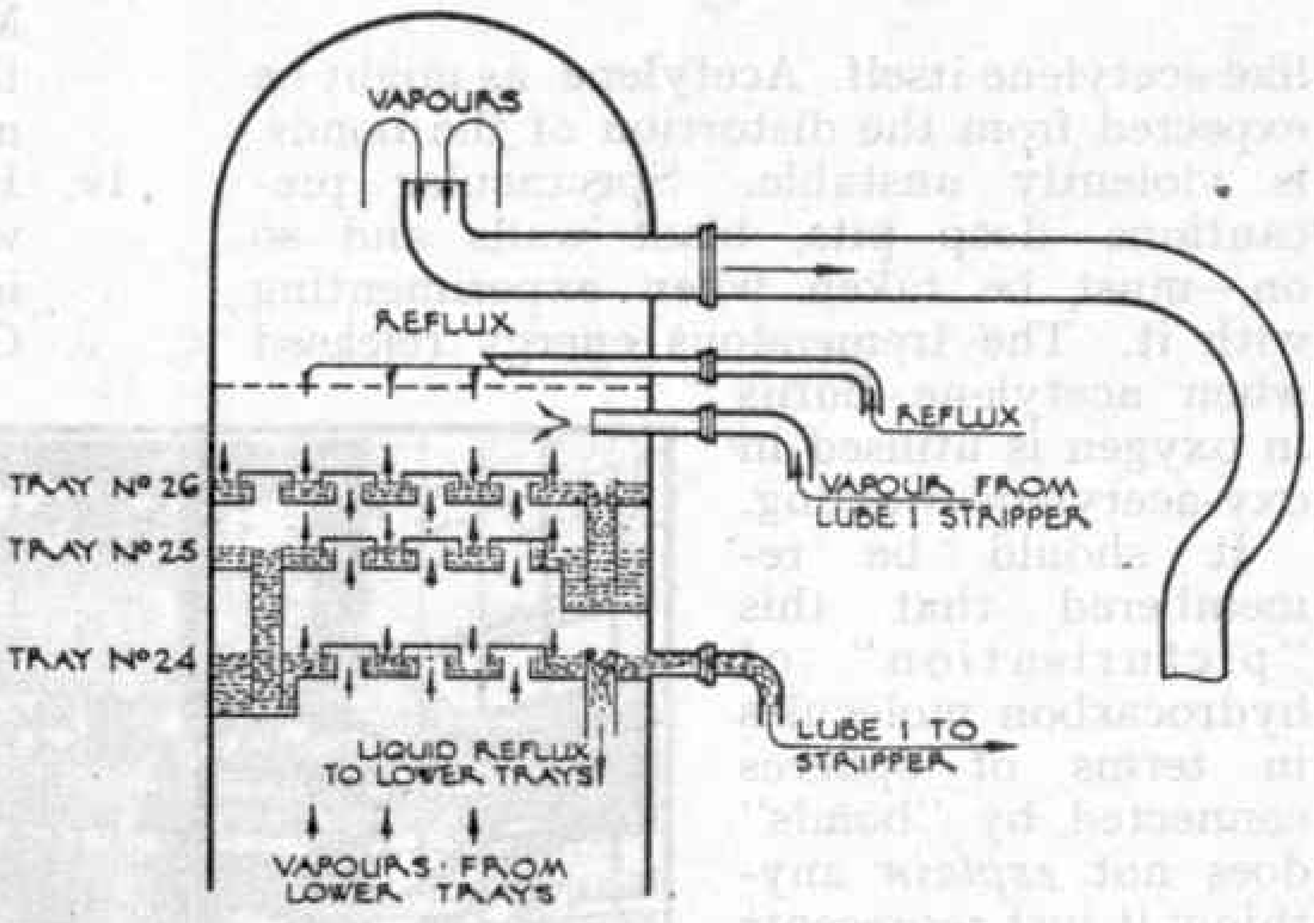
BUBBLE CAP

Fig. 3.

The principle of distillation is very simple: it consists of boiling the crude and collecting the groups (known as "fractions") as they condense at different temperatures. But, in practice, fractional distillation is more complicated. In the first place, to boil the crude at atmospheric pressure would mean heating it to such a temperature that chemical reactions would start in the crude itself and spoil the products. Secondly, distillation is a continuous flow process. Fig. 1 is a simplified diagram of the actual operation.

The crude is drawn from storage and pumped through a "tube still"—an oil-fired furnace lined with tubes through which the crude flows—in which it is heated to about 380 deg. C. From the tube still the crude passes to the vacuum fractionating tower (illustrated on the front cover of this issue). The tower is a lagged steel vessel fitted with 26 bubble trays (see Fig. 2). The large upper section of the tower contains 20 trays and there are six in the smaller lower portion. The whole tower is maintained under a high internal vacuum.

The hot crude enters the tower near the base and, under vacuum, most of it immediately vapourises; the high-boiling costituents fall as liquid on to the trays in the base. The crude vapours bubble up through the trays, as shown in Figs. 2 and 3. The lightest vapours are continuously drawn off the tower top through two vapour lines. Gas oil, one of the



FRACTIONATING TOWER TOP

MANCHESTER OIL REFINERY LTD.

Fig. 2.

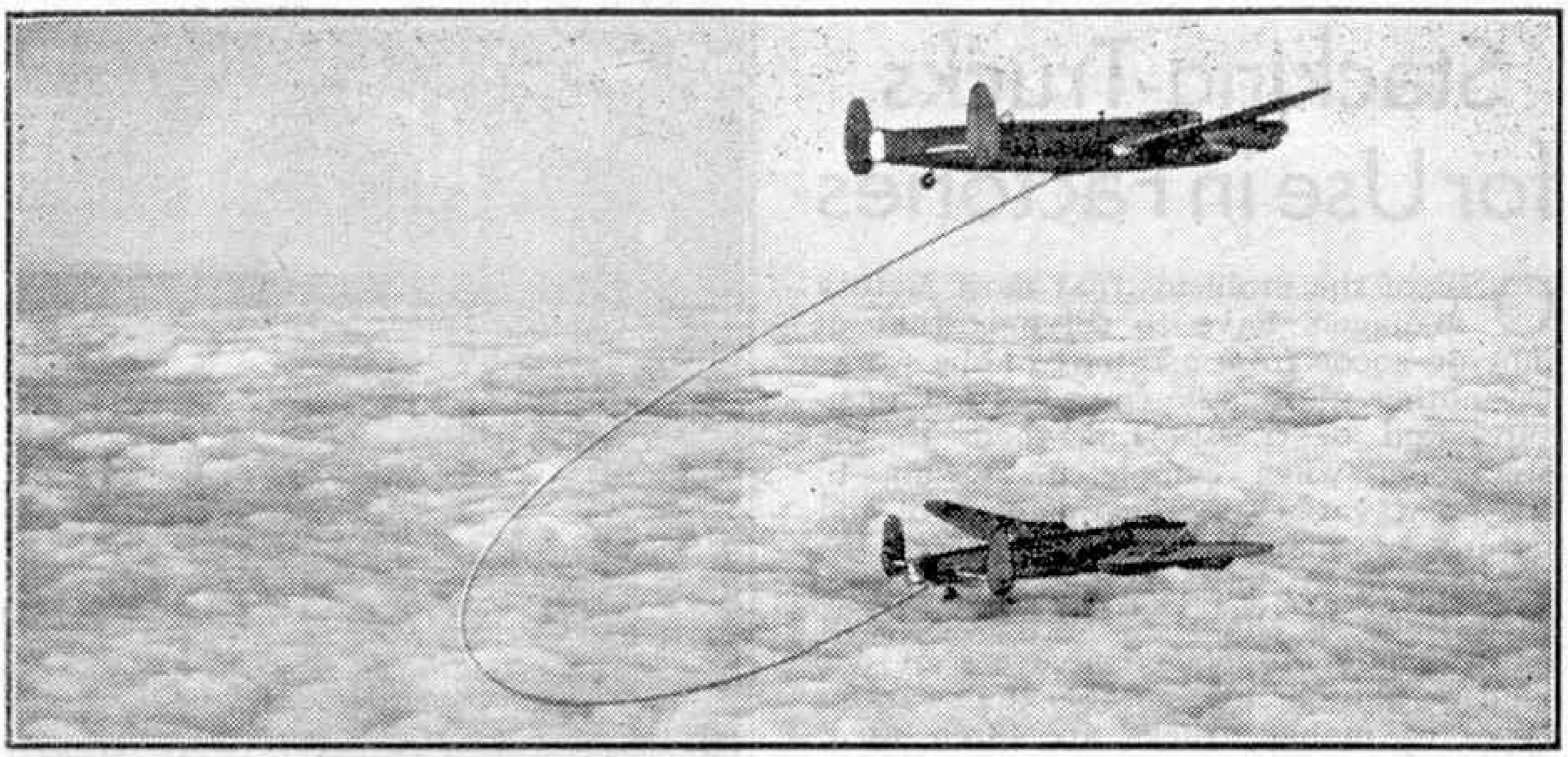
lighter fractions of the topped crude, is pumped in as "reflux" at the top of the tower and all the trays are full of liquid as shown, there being a continuous flow of liquid down the tower.

The reflux, flowing in at the tower top is quite cold, and maintains the tower top temperature at 165 deg. C. The crude, it will be remembered, enters at 340 deg. C. Thus, the vapours are getting gradually cooler as they ascend through the bubble trays, and the constituents condense according to their boiling points. By the time the vapours have passed through the top tray they consist only of gas oil and kerosene, all the other fractions having condensed on the way up. On the other hand, the reflux evaporates as it flows down from tray to tray, so that by the time it reaches the centre of the tower it contains no gas oil at all, but consists entirely of condensed crude vapours from the trays above.

The reflux is conveyed from just above the point of entry of the crude, to the base of the tower through a swan neck pipe as shown (Fig. 1) and flows—together with the liquid portion of the incoming crude—down over the bottom six trays. Superheated steam at 420 deg. C. blown in at the tower base evaporates a part of the liquid reaching the base so that vapour is also bubbling through the bottom trays. The unevaporated *residue* is withdrawn from the tower base and pumped to the residue storage tanks.

If all this has been followed, it will be seen that the liquid in each tray is just a little "heavier" than in the next tray above. Thus, if streams are withdrawn continuously from different trays up the tower, the boiling range of each stream will be different. This, of course, is the whole object of the distillation process.

The gas oil and kerosene vapours are condensed in two stages in order to separate the gas oil fraction from the kerosene fraction. Steam ejectors are attached to the kerosene condenser to maintain the whole system within the tower under high vacuum. The condensed gas oil and (*Continued on page* 68)



A fine photograph showing how flight refuelling is carried out. The practice of refuelling in flight on the Atlantic services will quadruple payloads and revolutionise the economics of civil aviation. Photograph by courtesy of Flight Refuelling Ltd.

Air News

By John W. R. Taylor

"Freighters" at Work

From every continent comes praise for the time and money-saving properties of the Bristol "Freighter."

One of these aircraft completed a 41,000 miles tour of the Americas early in 1947, and then went into service with L.A.V., the Venezuelan airline. For two months it took off daily on the 300 miles journey between the towns of Barinas and Caracas carrying two tons of bagged cement. For the return trip, 3½ tons of meat were loaded and carried on specially installed meat hooks. During this period the machine did not miss a single trip, despite extreme weather conditions. These varied between torrential rain and tropical sunshine, with the result that the short runways were usually a sea of mud or deep in dust.

Another "Freighter," "*Merchant Venturer*," has completed a 35,000 mile tour of Australia and New Zealand, lasting five months. At the end of the tour an ambitious air-freighting project was undertaken—the delivery from Melbourne to Launceston, Tasmania, of a fleet of tourist coaches, urgently required for the summer season. At least six of the 10 coaches were wanted for tours which had already been arranged. Strikes and shortage of shipping made delivery by sea impossible, and the coach operators appealed to the Bristol company's agent for aid. This was readily given, and thanks to the "Freighter" the entire fleet of coaches, each 22 ft. long and weighing 6,000 lb., were delivered in good time. As well as a coach, an additional 1,000 lb. of freight was carried on each flight. A load of approximately 7,000 lb. of miscellaneous merchandise was brought back on the return trips.

Another "Freighter" is being used for an aerial survey in Iran, mostly from a height of 22,000 ft. Special equipment installed in this machine includes a 300-gall. fuel tank to increase endurance, oxygen apparatus for the crew of five, various camera mountings, and heating equipment for the crew and cameras. The "Freighter" will operate from Abadan on the Persian Gulf, and search for new oil deposits over an area of 10,000 sq. miles. Each photograph taken will cover a very wide area, thus saving film and yielding quicker results.

More Orders for "Mariners"

A second order for Martin "Mariner" amphibian flying boats has been placed by the U.S. Navy with the Glenn L. Martin Company. This order makes a total of 36 boats now in production, enough to keep the production line busy until 1949.

The PBM-5A "Mariner" weighs 60,300 lb. and is the world's largest amphibian. Designed as a patrol-bomber, complete with guns, bomb racks and radar, it is really a "jack-of-all-trades" and can operate from almost any airfield or stretch of water, the use of JATO (jet-assisted take-off) enabling it to use small lakes or airstrips hitherto out of the question for such a large aircraft.

"Around the Globe by Air"

A leading Norwegian film director, Rasmus Breistein, has started shooting a film entitled "*Around the Globe by Air*." He is making a complete round-the-world flight by different airline companies, from Scandinavia to New York, across America to San Francisco, across the Pacific to Australia, on to Singapore and across India to Arabia and Cairo, and then via Rome, Marseilles, Paris and London back to Norway. The film, which will be in colour, is being produced as an educational film for all schools in Norway. Mr. Breistein estimates that it will take three months to complete.

Propeller Flown to Disabled Ship

For the second time, a propeller shaft for a disabled ship has been delivered by air to the other side of the world. Weighing more than 5½ tons, it was flown direct to Singapore in one of the Lancashire Aircraft Corporation's Handley Page "Halifax" freighters, resulting in a tremendous saving in time and cost. If the propeller shaft had gone by surface transport it would have reached the disabled ship at best nearly three months after it arrived by air. Resultant losses, caused by the ship being idle, would have totalled at least £10,000.

Bomber That Will Carry Own Fighter Aircraft

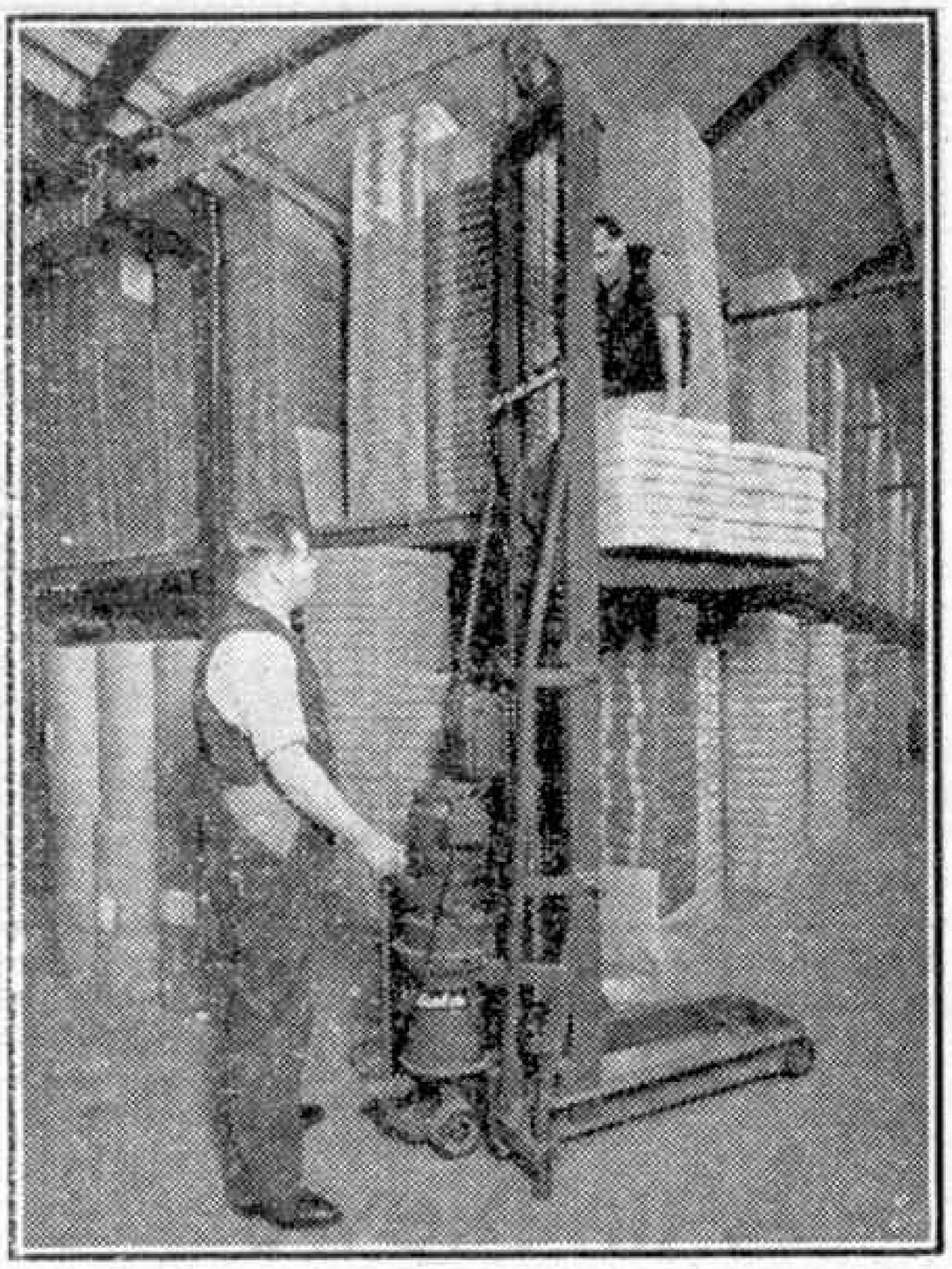
The U.S.A.F. have ordered 100 Consolidated-Vultee B-36 six-engined bombers, details of which were given in the February 1947 "*Air News*." A remarkable feature of this giant aircraft is that it will carry its own defence fighters. The McDonnell Company are developing a tiny jet-fighter, designated XP-85, which will be carried *inside* the B-36 and released only when the bomber is attacked by enemy fighters.

Stacking-Trucks for Use in Factories

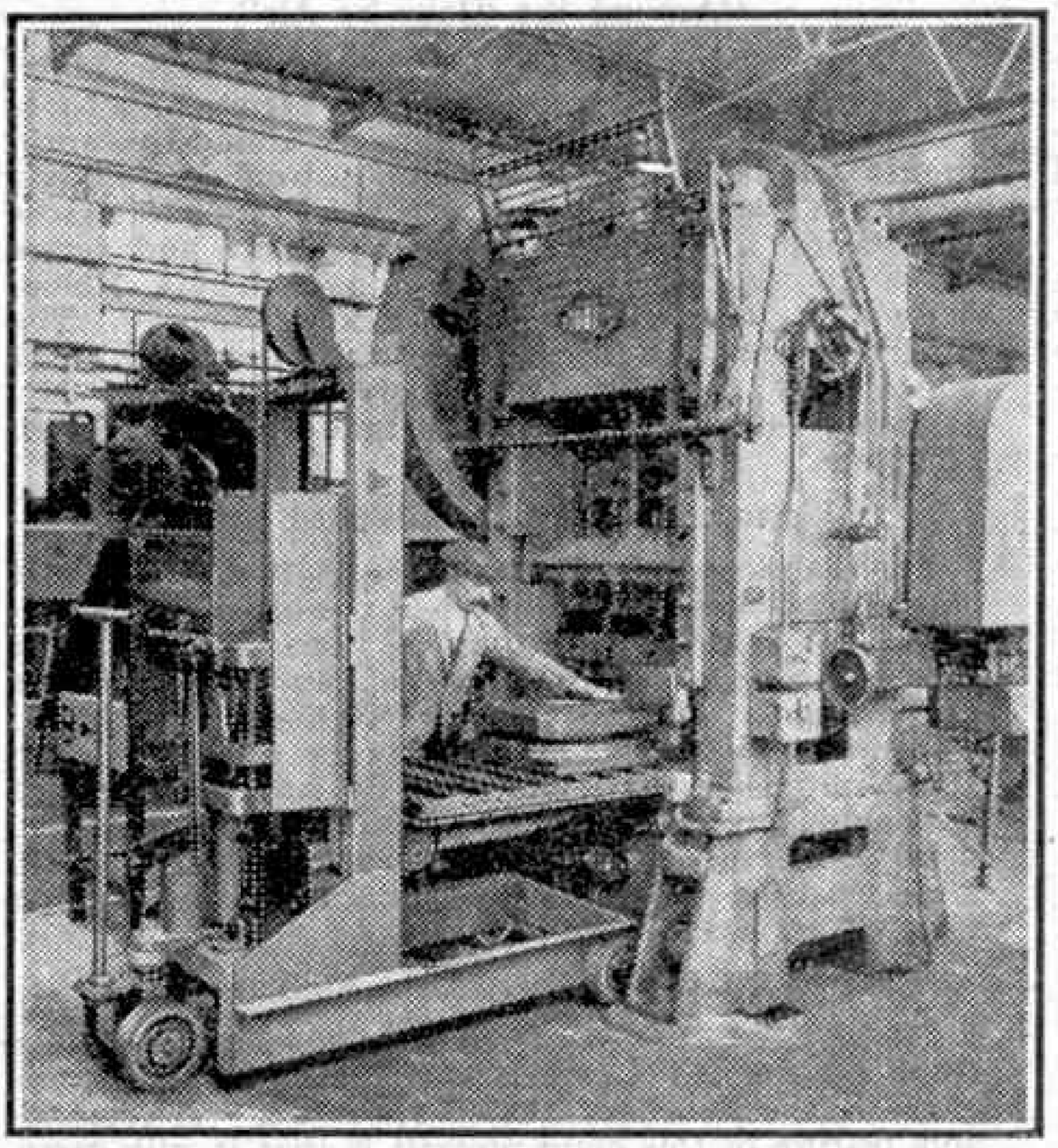
ONE of the problems that most factory managers have to solve is that of moving goods from one part of the works to another during the course of manufacture, and of transporting them to the stockroom when completed. Owing to the great variety in the weight, size and nature of manufactured products, the methods used for moving and storing them differ in almost every factory. For many kinds of goods conveyors of one kind or another are suitable, but various types of mobile trucks are often used, either independently or in conjunction with the conveyors.

Generally the trucks are so arranged that the platform on which the goods are carried can be raised to bring the load to a convenient height for removal on to tables or shelves in stockrooms.

Some of the most widely used commercial trucks of this kind are those manufactured by J. Collis and Sons Ltd., London. Two of their most interesting types are illustrated on this page. These are known as Collis Stacking Trucks, and are specially designed for carrying goods and stacking them in storerooms. They have other uses however, such as for lifting heavy tools on to press beds, and general carrying from one part of a factory to another.



The Collis electric-hydraulic Stacker in use at a paper mill. This machine has a lift of 108 in. and a load capacity of 10 cwt.



A Collis manual-hydraulic Stacker supplied to a large electrical works in this country. It is capable of lifting 15 cwt. to a height of 5 ft. In the illustration it is loaded with die tools for a large press.

The lifting table of the stacker is raised by a hydraulic ram. In some models this is controlled manually, and operates through a system of pulleys and wire ropes, which greatly reduces the effort required from the operator. In other types the hydraulic system is controlled electrically and the stacker will lift loads from 2½ cwt. to 5 tons to a height of 6 ft. A stacker of this kind is seen in the upper illustration, in use at a paper mill, while a manually controlled machine is shown below.

Lowering of the platform is effected by its own weight, and can be carried out at fast speed when the platform is unladen, and slowly when it is loaded. These speeds are under definite control, and self-acting mechanism prevents the operator from exceeding them. If the operator loses control of the stacker, the load platform automatically becomes stationary. As soon as the control handles are released the hydraulic ram becomes inactive and acts as a brake.

To prevent the stacker from moving when in use lowering or raising loads, it is fitted with **screw-down sprags.**

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller.

"GREAT NORTHERN LOCOMOTIVES 1847-1947"

By R. A. H. Weight (4/6)

We welcome this long-promised publication by our contributor Mr. R. A. H. Weight on a subject on which he has long been an acknowledged authority. Its appearance at this time is specially appropriate, as next month sees the centenary of the opening of the first section of the old G.N.R.

The book, which is published with official approval and co-operation, tells for the first time the whole story of the engines that have graced the King's Cross route from the earliest days until now. It is however no mere catalogue of the succession of "Little Sharpies," "Hawthorns," Sturrock masterpieces, Stirling eight-footers, Ivatt "Atlantics" and Gresley "Pacifics," to mention only a few of the classes that come instantly to mind when Doncaster engines are mentioned. Mr. Weight's account is enlivened by many personal reminiscences and it is the more interesting as the author maintained for some 25 years a close record of observations made by himself from his lineside residence and by friends elsewhere. He was intimately acquainted with the workings of the engines, and he enjoyed the friendship of many of their crews and of the officers and others responsible for the supervision of locomotive and traffic matters.

Although the Great Northern ceased to be 25 years ago, this story of its locomotives does not stop abruptly, but is continued to cover the developments of L.N.E.R. days. Large numbers of G.N.R. engines have remained in service and the continuance of the Doncaster tradition was assured by the appointment of Mr. (later Sir) Nigel Gresley as Chief Mechanical Engineer for the L.N.E.R. group. Existing Doncaster designs in several instances provided the basis of classes developed as L.N.E.R. standards, such as the well-known "Pacifics" and the numerous "K3" 2-6-0s. These and some of their notable performances are duly recorded.

In addition to the general narrative there is a chapter entitled "*Great Northern Miscellany*" that provides much fascinating material for the enthusiast concerning Great Northern customs and special items. In the course of his account Mr. Weight hints at a possible future railway and travel autobiography; judging by the present production this should be of extreme interest.

The numerous illustrations include line drawings and half tones and some of the subjects are distinctly rare. In addition there are various tables with dimensions of Great Northern engines built during the periods of the different locomotive chiefs. There is a complete summary of Doncaster Works numbers from 1867, when the first engine was built there, up to 1922, the last year of the G.N.R.

A bright green jacket fittingly covers the book which, at the price, represents excellent value. Copies may be obtained from booksellers, bookstalls, or selling agents, or direct from the author at 198, St. Helen's Road, Hastings, Sussex, at 4/10 each, including postage.

"BRITISH LOCOMOTIVES AT WORK"

By O. S. Nock, B.Sc.

(Greenlake Publications Ltd., London. 16/-)

Mr. Nock is well known to many of our readers for his articles on railway subjects and for his two previous books "*The Locomotives of Sir Nigel Gresley*" and "*Locomotives of the L.N.E.R.*," reviewed in these pages in March 1946 and January 1947 respectively. Older readers also will recall his many thrilling accounts of footplate trips that appeared in the "*M.M.*" before the war. "*British Locomotives at Work*" is a very pleasant reminder of those days, for many of the runs described in it were made during the five years prior to the war.

Very few people outside the railway service have had such an extensive footplate experience as the author. He has, in the course of time, travelled on the footplate practically from one end of the country to the other. Journeys in England alone are dealt with here; trips north of the Border will form the subject of a further book later.

The present publication is much more than a mere recital of times and speeds, gradients and regulator and cut-off settings. These necessary details are included and bear witness to the extreme thoroughness of the author's observations; on one journey alone he made 352 notebook entries in the course of 3¼ hours. Quite apart from this recording, however, Mr. Nock captures very successfully the atmosphere of the footplate, so that the reader shares with him the interest and the thrill of the trips he so graphically describes.

There are 12 chapters, in which are featured runs on each of the principal main line routes, East Coast, West Coast, Southern and Western, and also on the former Lancashire and Yorkshire, Midland and Great Central lines and on a variety of interesting routes of a cross-country character. Interesting comparisons are made in many instances between various journeys with different engines on the same route. Gradient profiles, route maps, and diagrams of many of the engine classes mentioned contribute considerably to the usefulness of the book. The horsepower developed in achieving many of the more spectacular feats described is calculated, and an appendix gives special attention to this side of locomotive performance.

Illustrations on the whole are interesting, especially some of the earlier ones, while the collection of cab interior views is noteworthy.

Copies of the book can be obtained from booksellers, or direct from the Locomotive Publishing Co. Ltd., 88, Horseferry Road, London S.W.1, price 16/6 including postage.

"BONNY THE PONY"

By Ruth Clarke (Warne. 6/- net)

Bonny was a quaint little foal who began life in the freedom of Exmoor. When the time came for the round-up of the herd of wild ponies to which he belonged he was caught by Ken Rivers, but this was only the beginning of his adventures, for he breaks away from a hard-hearted trainer and for a time roams freely round the countryside. He is restored to his young master, with whom he has very good times. He learns remarkable tricks and actually helps to save lives under great difficulties. Then he is stolen, but everything turns out happily in the end.

"DAWNAY LEAVES SCHOOL"

By Hylton Cleaver (Warne. 6/- net)

Dawnay has to leave Lorde's at mid-term, and along with Mr. Le Smith, a quaint but staunch supporter, he finds a post in London with a firm whose principals are cricket fanatics. This leads to his return to his old school with a cricket team, and there he finds that he is suspected of thefts. Everything is cleared up and eventually he is able to take up his old post as head of the school. The story is exciting, and is told in a pleasant way, with humorous incidents and unexpected turns.

Railway Notes

By R. A. H. Weight

News from the L.M.S.

Britain's first main line diesel-electric locomotive, No. 10000, was completed at Derby Works and exhibited at Euston in December last, after successful trial runs which are being continued. A second engine under construction also is powered by a 16-cyl. 1,600 h.p. "English Electric" diesel unit. When two locomotives of this type are coupled together, the combined 3,200 h.p. exerted would be ample for the haulage of the heaviest long distance expresses, and they would be capable of high speed. In due course comparison will be made between diesel-electric and ordinary steam locomotive performance.

Also named and exhibited in London just before last Christmas was new 4–6–2 No. 6256 "*Sir William A. Stanier, F.R.S.*," a beautifully finished "7P" express engine of the latest style, equipped with roller bearing axle-boxes. It was fitting that at the close of the separate existence of the L.M.S. this fine locomotive should have been named after the Chief Mechanical Engineer who introduced the 4–6–2 and other powerful types, now standard, during recent years. The new class "4" 2–6–0 freight engines of novel design are now in production at Horwich, and examples will probably be seen on the road by the time these lines appear in print.

A school for the full-time practical and theoretical training of apprentices engaged in the L.M.S. Mechanical Engineering workshops has been opened at Derby. Admission is based strictly on merit and no premium is payable.

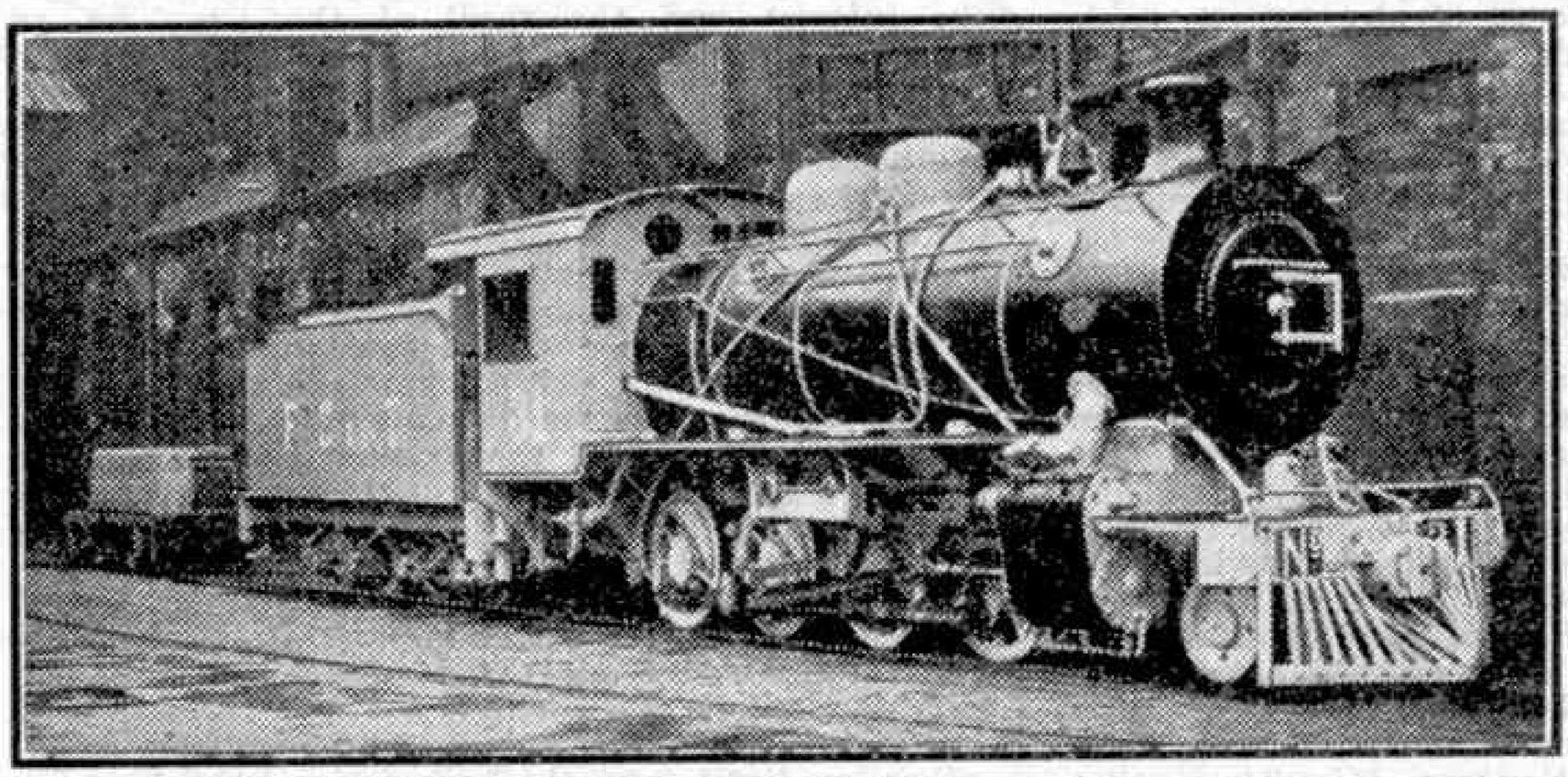
As part of the national campaign to make more goods wagons available, additional repair depots have been opened at 11 centres near to large sidings or junctions. Altogether more than 40,000 wagons have been repaired within a fortnight.

The London-Barking-Southend line carries dense residential traffic through an area particularly liable to fog. It is therefore an appropriate region for the large scale trial of a system of automatic train control that has involved the fitting of special safety equipment to 183 locomotives and 110 signal locations between Bow and Shoeburyness. The effect is somewhat similar to that of the system in use on the G.W.R. An electrical warning is given in the engine cab by sounding a horn if the distant signal is at danger, a visual indication also appearing. Should the driver not operate an acknowledging device, and take action within three seconds under such circumstances, a full application of the brake takes place, automatically bringing the train to a stand. When the signals are at clear, a short reassuring hoot sounds in the cab with no effect on the brakes.

Last September we published a special article commemorating the centenary of the Caledonian Railway, and it is of interest to note that on 15th February this year will occur the 100th anniversary of the opening of the through railways to Edinburgh and Glasgow, which were connected with London by rail for the first time on that day in 1848.

Big Narrow Gauge Locomotive for Peru

We illustrate this month a notable 2–8–0 heavy freight locomotive recently completed by the Hunslet Engine Co. Ltd., Leeds, for service on the 3 ft. gauge Trujillo Railway belonging to the Peruvian Corporation in South America. Although the axle load was not allowed to exceed 12 tons, adhesion weight is almost 48 tons and this two cyl. oil-burning engine is probably one of the most powerful of its kind so far built. Features include steel bar frames, piston valves, superheater, 44-in. coupled wheels, steam brake and an 8-wheeled bogie tender. The arduous requirements of the owners included the haulage of 400-ton freight trains over ruling gradients of 1 in 50 on a track comprising many sharp curves.



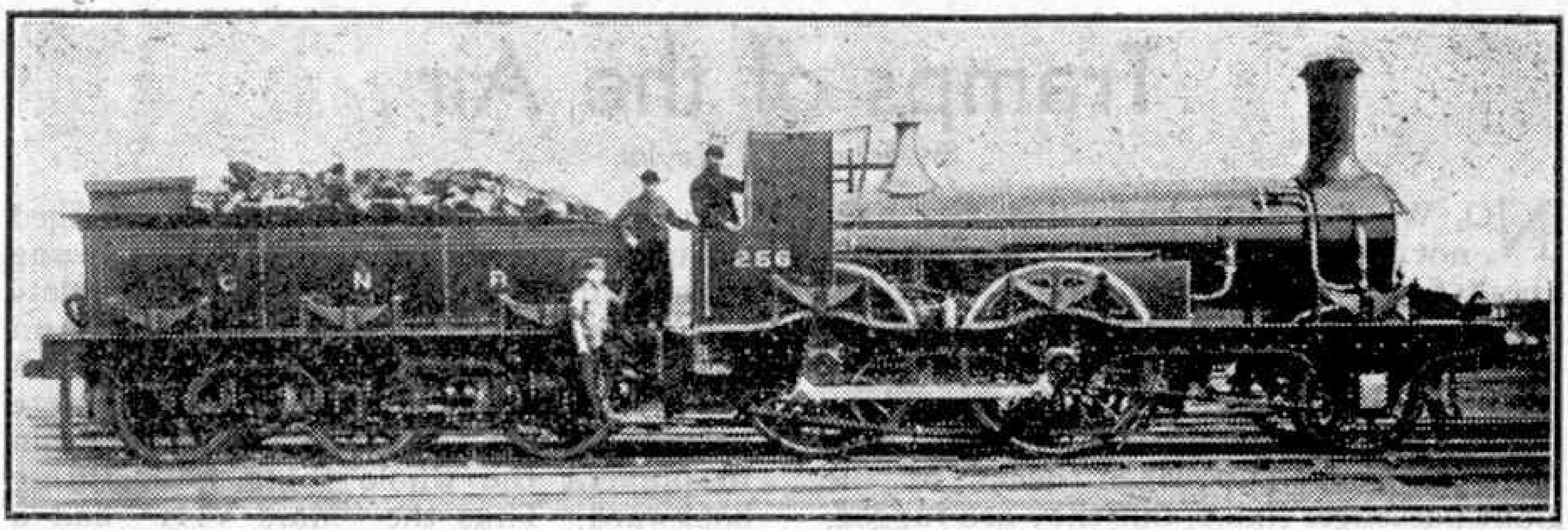
An oil-burning 2-8-0 locomotive recently built for service on the narrow gauge Trujillo Railway by the Hunslet Engine Co. Ltd., Leeds, by whose courtesy this illustration is reproduced.

L.N.E.R. Notes

The large electric locomotive numbered 6000, built in 1941 as a prototype for the future operation of the electrified Sheffield-Manchester section, has been doing excellently while on loan to the Netherlands Railways in Holland, where grand work has lately been done in rehabilitating the tracks and rolling stock. The British 1,850 h.p. engine has been running 400 miles a day, five days a week, hauling passenger trains with which, loaded to 330 tons, acceleration up to 62 m.p.h. has been achieved on the level within 4 min., and the maximum permitted speed of 65 m.p.h. attained in 5 min. On many occasions when hauling freight trains loaded up to a maximum of 1,600 tons, a speed of 40 m.p.h. has been reached in 5 min. It was found during trials on the short Manchester-Altrincham joint line here that, with a train of six coaches weighing 250 tons, a speed of 25 m.p.h. could be attained in 25 sec., equivalent to the rapid acceleration of many suburban multiple-unit electric services.

Streamlined "A4" locomotives Nos. 26 and 28 have been renamed "*Miles Beevor*" and "*Walter K. Whigham*" respectively, after the Acting Chief General Manager of 1947 and a senior Director. Like other 4–6–2s of the class recently overhauled at Doncaster, they returned to service painted blue with smart chromium lettering. We understand that names are being given to certain "B1" 4–6–0s of the 12xx series still coming into traffic, with electric light.

The "*Yorkshire Pullman*" express has been reported arriving at King's Cross well before time on a number of occasions. Its haulage is shared by "A3," new "A2/3" and "A4" class "Pacifics." Mr. Peppercorn's new "A2" No. 525 was completed at the end of last year, presenting several changes in detail of design which we hope to describe shortly. It was named "*A. H. Peppercorn*" at Marylebone Station.



A Sturrock 2-4-0 of the former G.N.R., No. 256. This is one of the fine illustrations included in "Great Northern Locomotives 1847 - 1947" by R. A. H. Weight, reviewed on page 47.

Great Western Notes

New modified "Hall" class 4–6–0s lately placed in service are numbered and named as follows: No. 6977, "*Grundisburgh Hall*"; No. 6978, "*Haroldstone Hall*"; No. 6979, "*Helperly Hall*"; No. 6980, "*Llanrumney Hall.*" No. 1011 has received the name "*County of Chester.*" Cleanliness of locomotives is improving and more lining-out of the green-painted finish to be noted on many 4–6–0 express or new mixed traffic engines.

We have received news of a run from Birmingham to Paddington behind "County" class 4–6–0 No. 1002, with an 11-coach train weighing about 355 tons full at a time when there was a good deal of track repair work going on. The train was diverted to the relief line between Tyseley and Widney Manor, but travelled at high speed down Hatton bank, only to be checked to 28 m.p.h. through Warwick, so 33¼ min. were occupied to Leamington stop. There was a long slowing through Banbury, followed by moderate speeds over the cut-off line to Princes Risborough. When making the usual slow passage of High Wycombe No. 1002 was only about 3½ min. down on a moderate schedule. After attaining 72 m.p.h. near Gerrards Cross there was a reversal at Denham to the down line in consequence of engineering operations, but the net time into Paddington from Leamington, 87 miles, was not more than 113 min. compared with 116 allowed.

Southern Tidings

New "Battle of Britain" 4–6–2 locomotives completed just before the close of 1947 and allocated to Ramsgate were No. 21C 168, "*Kenley*"; No. 169, "*Hawkinge*"; No. 170, "*Manston.*" The names are those of aerodromes in Surrey or Kent which shared the brunt of fighting the Battle of Britain in 1940. These engines are very smartly finished and well appointed. More of the 21C 12x batch have been transferred from Ramsgate to Exeter (Exmouth Jn.) Shed. A little of the darker L. and S.W.R. olive green paint was evidently in stock at Eastleigh when there was a shortage of the new standard lighter malachite, as it appeared recently on a few repainted engines.

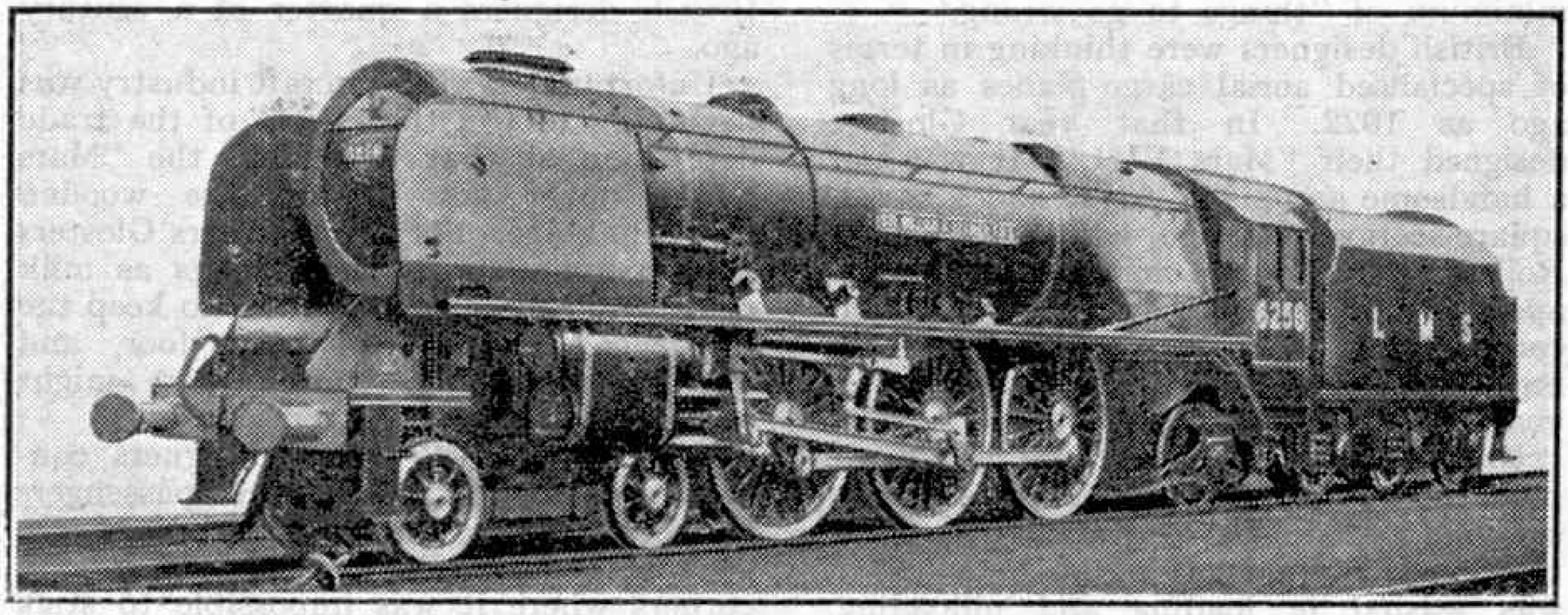
The Old Order Changeth

Up to and including this issue, in order to avoid any too sudden complication we have used as headings the railway group names or initials that have been familiar for 25 years, though actually these ceased to apply officially on 1st January last, when the Transport Commission through its Executive Committee assumed control of all our principal railway systems.

In future we shall use the names of the six regions into which our railways have so far been divided. These are:

1. London Midland Region, corresponding to the L.M.S. in England and Wales.
2. Western Region, corresponding to the G.W.R.
3. Southern Region, corresponding to nearly all the S.R.
4. Eastern Region, corresponding to L.N.E.R. Southern Area.
5. North Eastern Region, corresponding to the L.N.E.R. North Eastern area.
6. Scottish Region, corresponding to those sections of the L.M.S. and L.N.E.R. in Scotland.

References to locomotives or rolling stock, etc., will continue where necessary to indicate their previous ownership or origin.



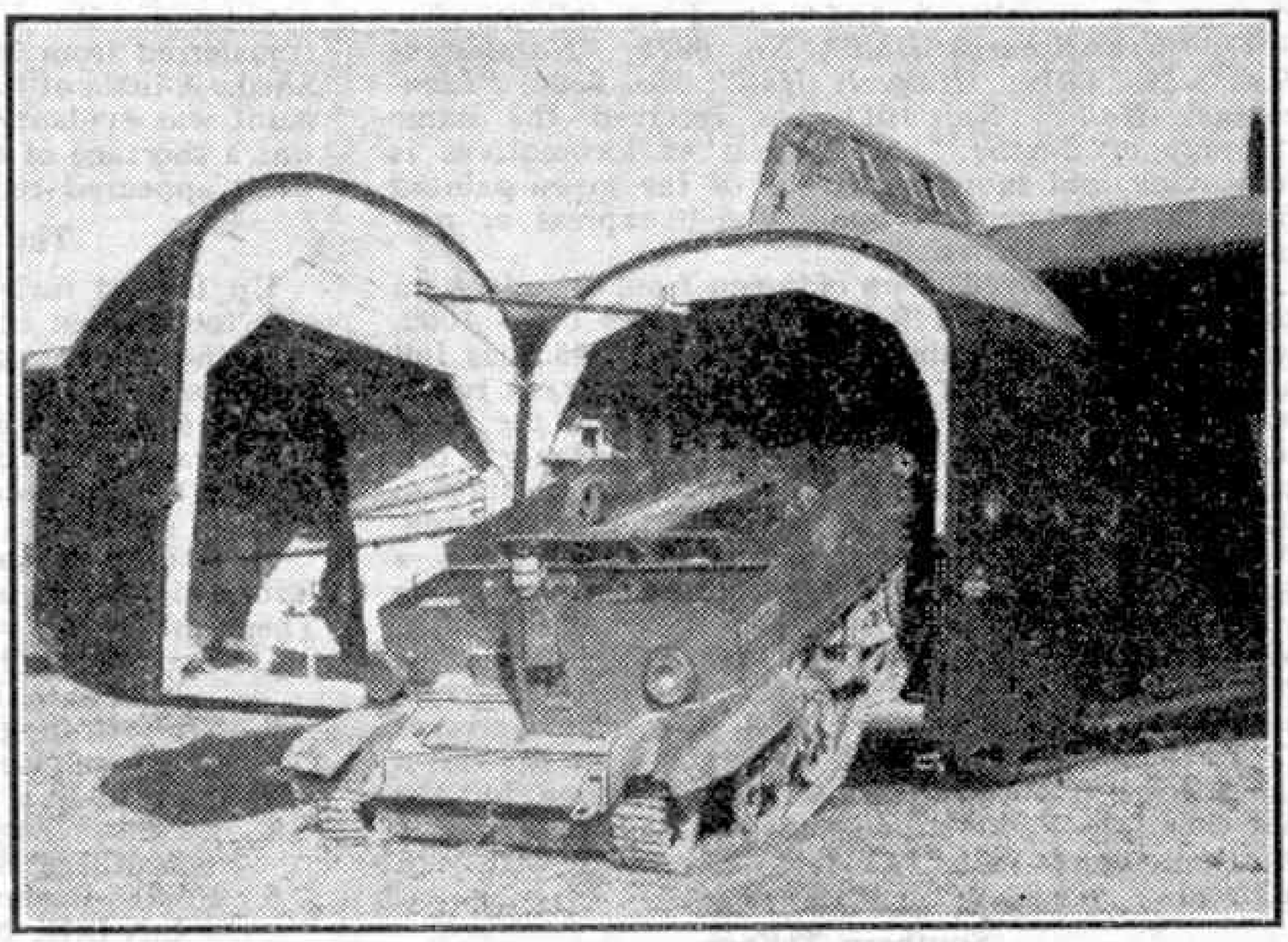
L.M.S. No. 6256 "Sir William A. Stanier, F.R.S.," the first of two 4-6-2s equipped throughout with roller bearings. Photograph by courtesy of the L.M.S.

Tramps of the Air

By John W. R. Taylor

NO, Wearie Willie and Tired Tim have not taken to the air. This story is about a different sort of tramp—an aerial counterpart of the sturdy little steamers which carry the flag of Britain's merchant navy to every corner of the earth. These tramp steamers lack the glamour, the fresh paint and polished decks of the giant passenger liners, but they are rugged, hard-working and profitable. In the same way the modern tramps of the air are not streamlined, fast or luxurious, but they are designed to do a real job of work, and they do it well.

We can feel proud of the fact that our British aircraft industry leads the world in the design of these "utility" cargo-planes. Over in America operators still use stripped-down, freighter versions of the Douglas "Dakota" and "Sky-master"—undoubtedly efficient and reliable machines, but rather like using a Rolls-Royce limousine to haul coal. They were designed as fast, beautifully fitted-out air liners, capable of carrying comparatively light loads of passengers at high speeds. Their luxury, speed and stream-lining are all unnecessary for freight work, where the essentials are a big payload, ease of loading and unloading and a minimum of "things to go wrong."



Bren Gun Carrier emerging from a "Hamilcar" glider.

British designers were thinking in terms of specialised aerial cargo-planes as long ago as 1922. In that year Glosters designed their "Mars VIII." It was not a handsome aeroplane, for it had a squat, square-section fuselage with a 360 h.p. Rolls-Royce "Eagle" engine stuck almost apologetically on the front. But it incorporated several ingenious features that have been resurrected within the last few years as clever new ideas.

Glosters realised that there was little point in having an aeroplane capable of carrying a useful payload at higher speeds than surface transport if the time gained was wasted in loading and unloading. So they went all out for easy loading. The rear part of the fuselage was hinged aft of the wings so that it could be swung round through 90 deg. to give complete access to the cargo compartment. And that was not all! A partition folded down to form a loading ramp, and jacks were provided under the rear part of the cabin to prevent the whole thing from tilting backward. Thus the "Mars VIII" had a level cabin floor, no special equipment was needed to load it and it was designed to carry a useful load of 1,600 lb. at a speed of over 100 m.p.h. Compare these figures with any of the much-boosted, small modern transport aircraft and you will see how advanced were the ideas of British designers a quarter of a century ago.

Unfortunately, the aircraft industry was beginning to feel the effects of the trade depression at that time, and the "Mars VIII" never got beyond the wooden mock-up stage. For several years Glosters had to manufacture such things as milk churns and motor car bonnets to keep the two-legged wolves from the door, and but for those milk churns there might never have been a "Meteor"!

For the next 17 years designers concentrated on carrying more passengers farther, faster and in greater luxury. In general, freight was carried only in odd corners where it was impossible to stick in a few more seats. Then the war started,

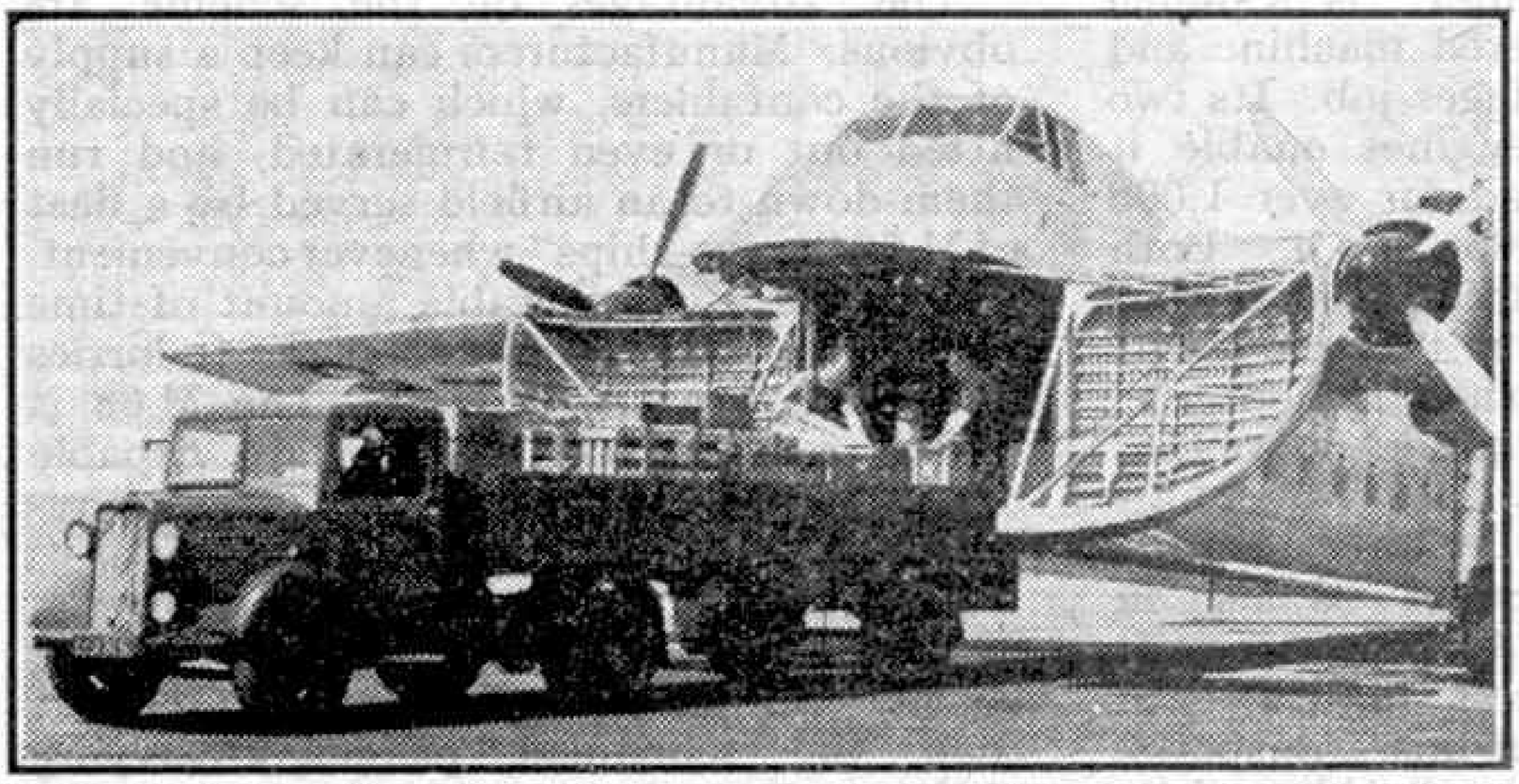
Miles "Merchantman" 4-engined freighter aircraft. Photograph by courtesy of Miles Aircraft Ltd.

a war in which air power held the key to victory on land and at sea. The disastrous campaign in Crete changed the whole conception of modern warfare. Scores of old, mass-produced Junkers 52 transports, hundreds of cheap wood and canvas troop-carrying gliders were flung into battle by the Germans, regardless of loss. The gliders were roomy to enable the biggest possible load to be carried and they had a low landing speed that enabled them to crash-land anywhere, independent of landing strips. The fact that they had no engines, no complicated hydraulic, fuel, oil or pneumatic systems, few instruments, simple undercarriages, and could be built of cheap materials by unskilled labour were all assets as long as they did the job—and they did.

The Germans carried the idea even further with their Messerschmitt 323 "Gigant," producing a "utility" air transport *par excellence*. It was an incredible machine with a wing span of 181 ft., six mass-produced French engines, a 10-wheeled undercarriage and an armament of up to 18 machine guns. It was an ugly, fabric-covered pantechnicon, but it carried fantastic loads of tanks, guns or soldiers. Hundreds of them lumbered through the Mediterranean skies to carry supplies to Rommel's Afrika Korps. Unfortunately for the "Gigants," the Luftwaffe was fully occupied elsewhere and R.A.F. fighters used the giant transports for shooting practice, making them rather more expendable than had been planned.

There was, however, no longer any doubt of the value of airborne forces and airborne supplies. The Allies learned their lesson well and the subsequent achievements of the British and American Airborne Divisions added a glorious chapter to our history. The "Horsa," "Hadrian" and "Hamilcar" gliders that carried them into action contributed no less to victory than did the "Spitfires," "Thunderbolts" and "Lancasters" that ensured their safe passage. It is possible that the glider may have its use in peacetime but this seems unlikely. For freight-carrying it lacks the mobility of even the cheapest, lowest powered orthodox cargo-plane, and it is right out of the question for passenger work. It sways and bucks at the end of its tow-line and, with its flaps down, has the gliding angle of a brick—definitely not the sort of aircraft in which to give Aunt Matilda a two bob trip round the lighthouse!

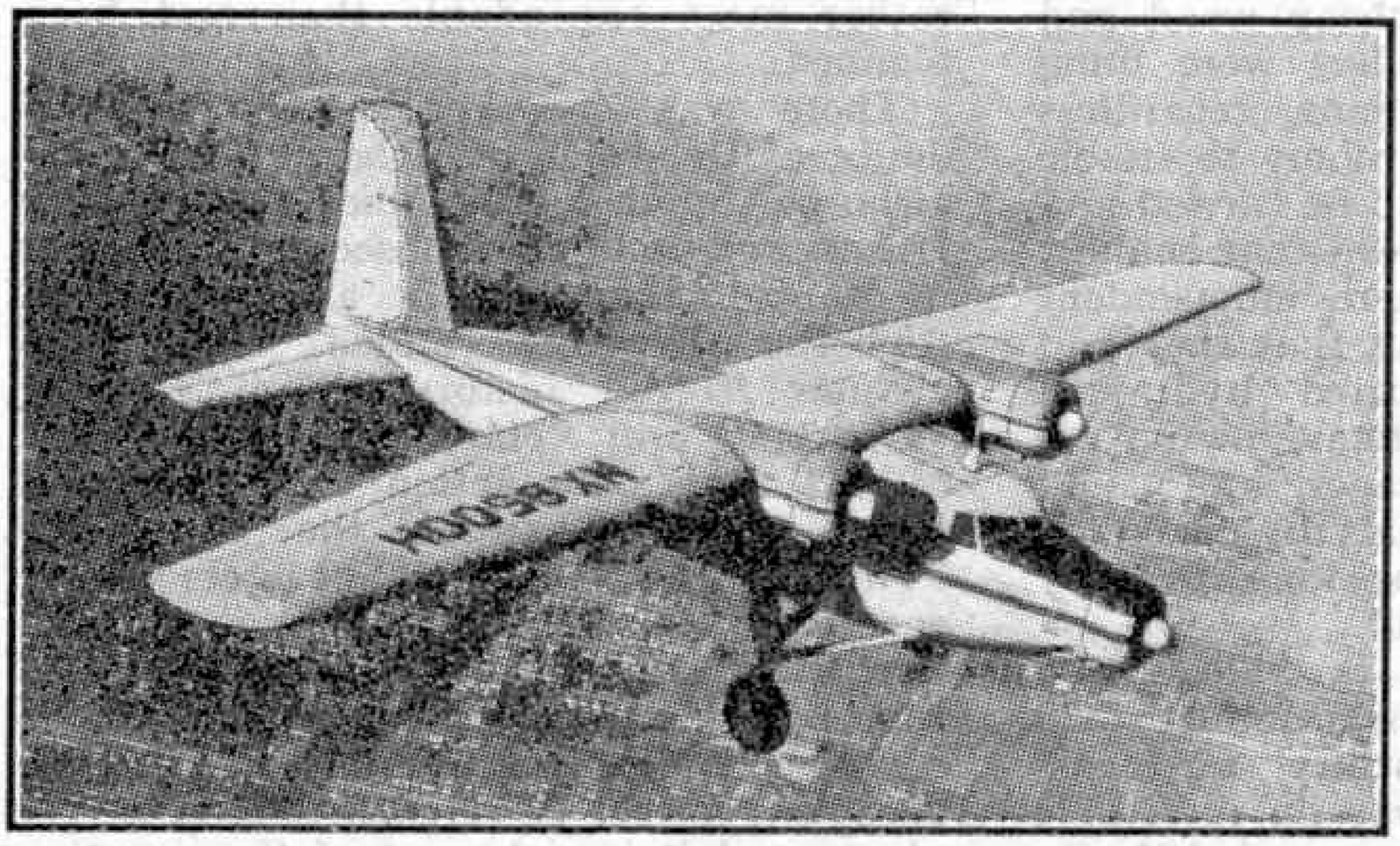
But many of the glider's features are as useful in peaceful commerce as they were in war, and it is these that are being built into our new tramp-planes. The whole nose of the tank-carrying "Hamilcar" was designed to hinge open, so that its cargo could race into action, guns blazing, within seconds of the glider touching down. Easy loading and unloading are equally important to a commercial



Loading a Bristol "Freighter." It can carry about five tons of cargo. Photograph by courtesy of The Bristol Aeroplane Co. Ltd.

aircraft for quick turn-round, and the latest British transports share the simple construction, low speeds, extensive cargo-space and quick-loading facilities of the gliders. But they combine them with sturdiness and reliability fitting them not for just one trip but for years of efficient operation on the world's skyways.

First of these post-war "flying box-cars" was the Miles "Aerovan," followed soon afterwards by the Bristol "Freighter." Both have brought new standards of economy and efficiency to civil aviation. They are twin-engined, high wing monoplanes with capacious, square-section fuselages, but without such expensive luxuries as retractable undercarriages. They cruise at comparatively low speeds



The Northrop "Pioneer," America's first "Utility" cargo aircraft. Photograph by courtesy of Northrop Aircraft, Inc., U.S.A.

but show incredibly low operating costs. As a result both are in great demand by operators all over the world. The little "Aerovan" is the one-ton lorry of the air, its two 155 h.p. Blackburn "Cirrus Major" engines giving it a range of 700 miles at 110 m.p.h. The "Freighter" is a much larger, more highly powered machine and does a correspondingly bigger job. Its two 1,690 h.p. "Hercules" engines enable it to carry a 5½ ton payload for over 1,000 miles at a speed of 165 m.p.h. Both machines have large loading doors, that of the "Aerovan" being at the rear of its pod-like fuselage, while the "Freighter's" bull-nose is formed by two huge doors that hinge sideways.

A passenger-carrying version of the "Freighter"—the "Wayfarer"—is also in service, carrying up to 32 passengers at slower speeds and in less luxury than modern, high-speed feeder-line transports, but at a much lower cost. An idea of its popularity can be gained from the fact that, in its first four months of service with Channel Islands Airways, the prototype carried more than 10,000 passengers some 64,000 miles, and without the slightest mechanical trouble.

The "Aerovan" proved so popular and useful that Miles have now built a larger version, powered by four 250 h.p. de Havilland "Gipsy Queen" engines, which they have named the "Merchantman." It is identical in layout to its smaller brother and, as might be expected, carries a pay-load of some two tons for a little longer range and some 35 m.p.h. faster.

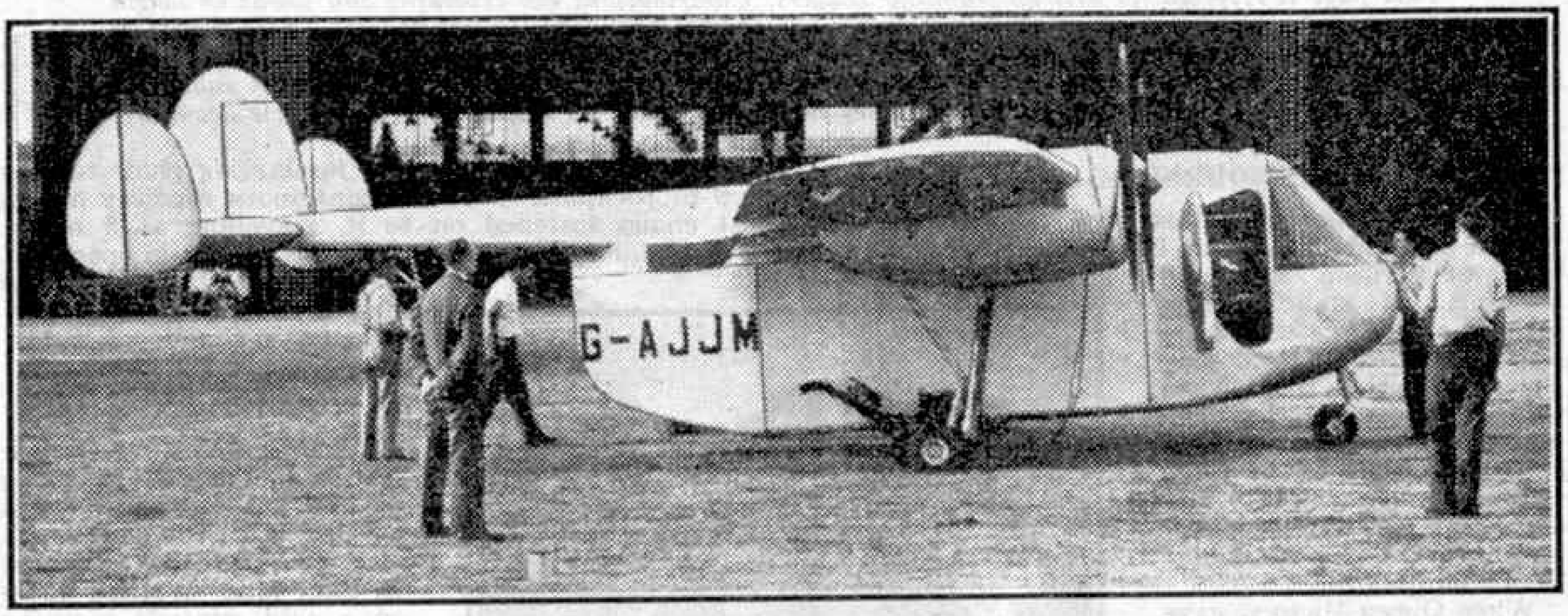
But the most unorthodox and interesting of all these new "utility" cargo-planes is the M.68 "Box-car," also built by Miles. It is very like the "Merchantman" in appearance, and is designed so that the entire freight-hold portion of its fuselage can be detached and used as a road trailer. This centre portion of the fuselage is in effect nothing more than a rectangular container, fitted with removable road wheels and a towing bar. What happens is that, when the aircraft reaches its destination, the container complete with cargo is simply removed and towed away by car. Without any delay another container can then be fitted into its place, or alternatively the rear part of the fuselage can be removed and fitted on behind the cabin portion and the aircraft flown off in rather abbreviated form.

The advantages of the scheme are obvious. Manufacturers can keep a supply of the containers, which can be specially fitted out or even refrigerated, and run them down to an airfield served by a fleet of M.68 "cargo-ships" whenever convenient. This saves a considerable amount of time usually spent in loading goods on to lorries and then into the aircraft. The M.68 is indeed a tramp ship of the air, capable of carrying a wide variety of goods anywhere at short notice and at low cost.

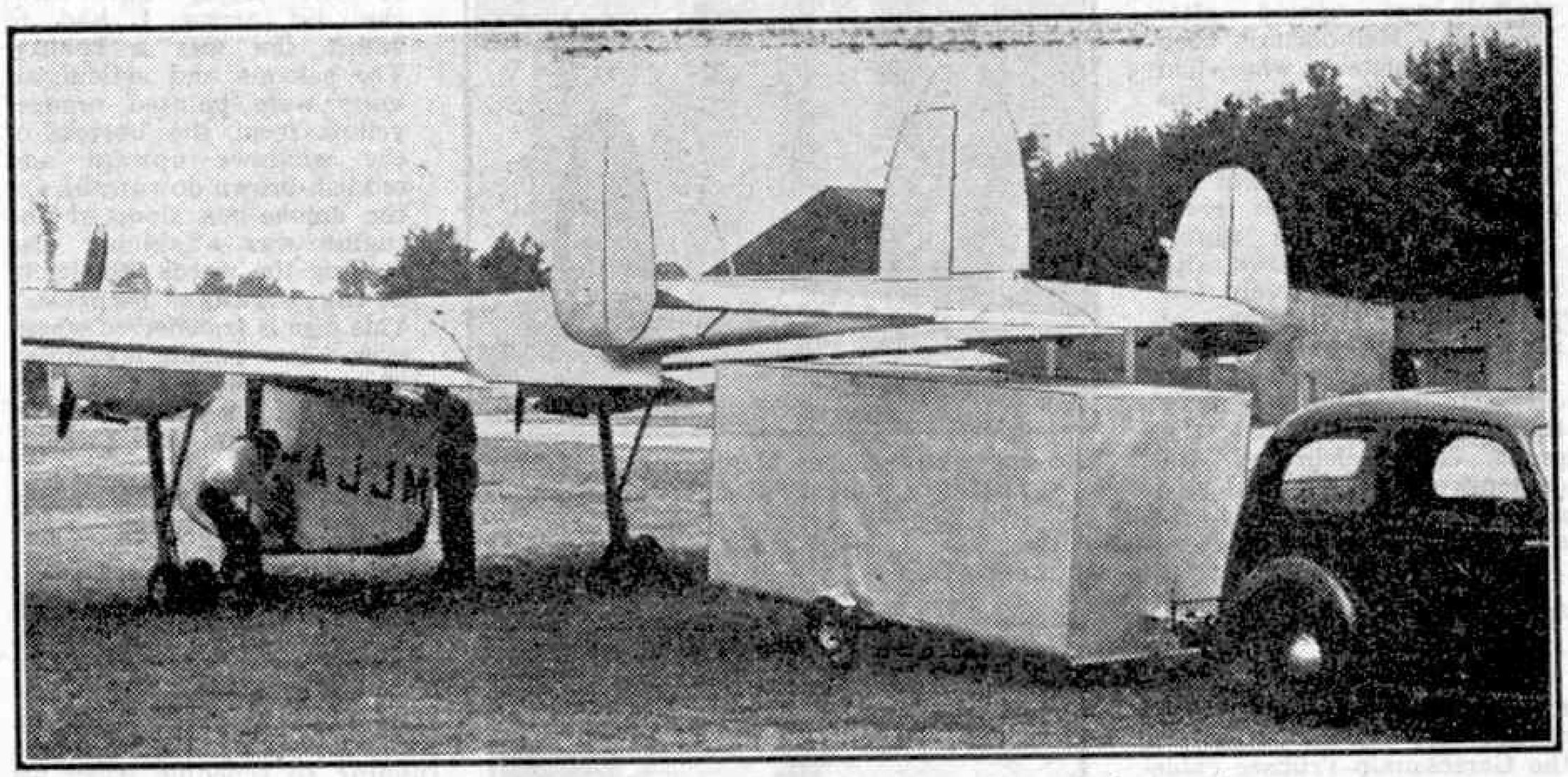
Air tramping is not just a woolly dream of the future. In America freight-carrying charter companies operate more aircraft than the scheduled passenger-carrying airlines. Here in

(*Continued on page 68*)

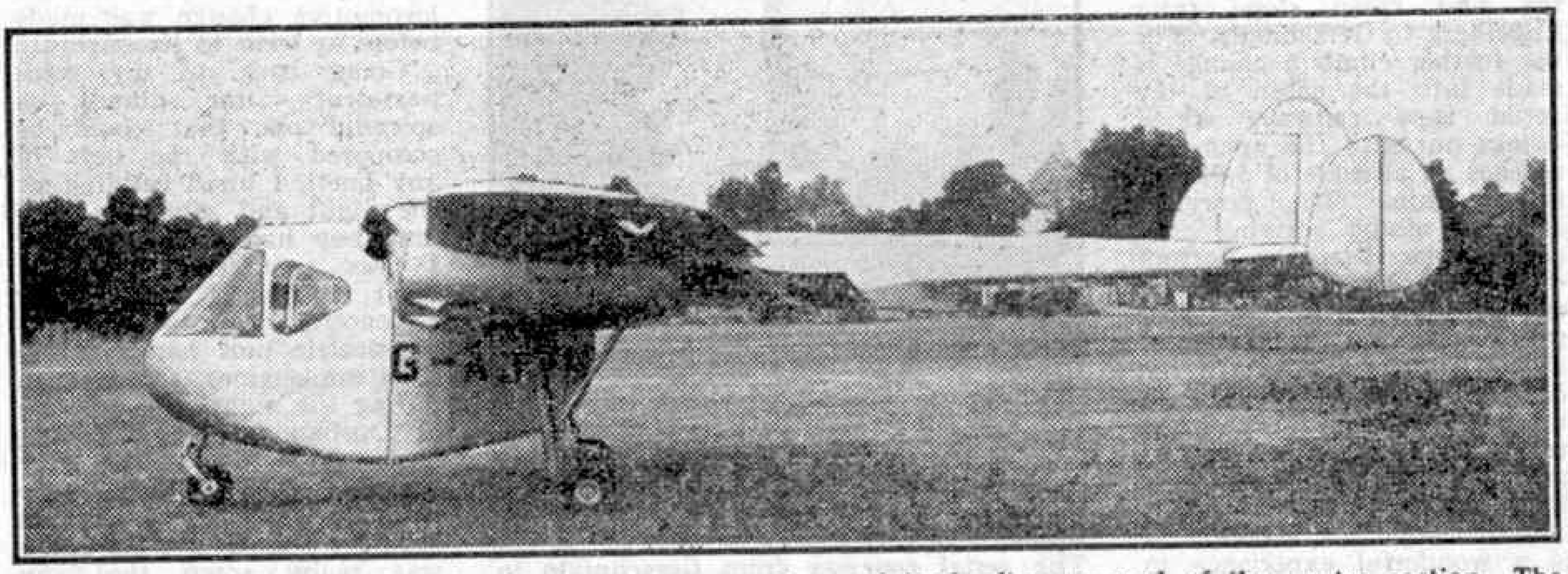
A Novel British Freighter Aircraft



The Miles M.68 has a detachable centre section fitted with removable road wheels and a towing bar.



The loaded container centre section detached and being towed away by car.



The M.68 as it appears with the front and rear portions rejoined after removal of the centre section. The photographs on this page are by courtesy of Miles Aircraft Ltd.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

MELBOURNE MILL

The accompanying illustration shows the old watermill at Melbourne in Derbyshire, which at the time of writing was still working. It stands on a historic site, for a mill there was mentioned in Domesday Book. At the time when this was compiled the town possessed "a priest and a church and a mill of three shillings and twenty-four acres of meadow land." Melbourne took its name from "Mill-bourne."

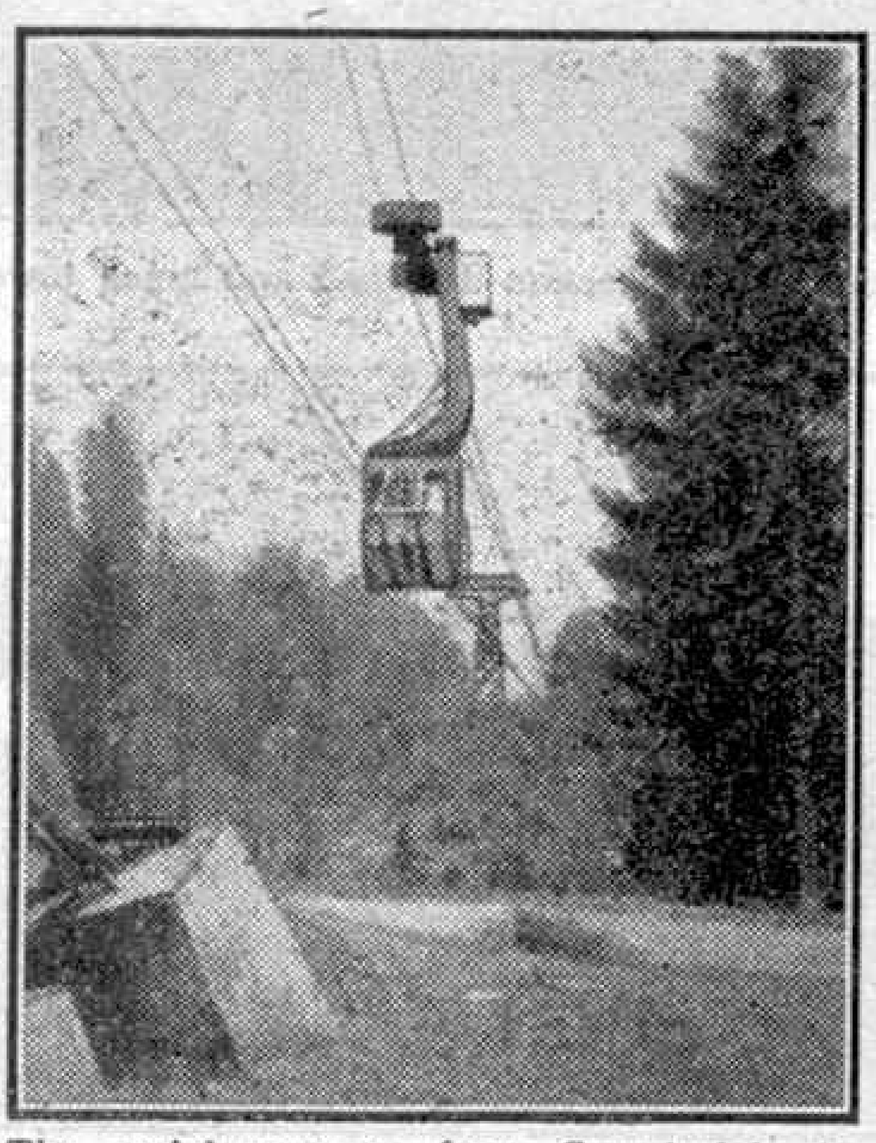
When Queen Victoria gave her name to the now well-known state of Australia its capital was named after Viscount Melbourne, then Prime Minister, who had taken his title from this Derbyshire town. It is strange that a mill should be the indirect origin of the name of one of our great capitals across the world. While the home town still has only comparatively few people, the population of its namesake has grown in 100 years from a few hundreds to considerably more than a million. When the great city celebrated its centenary messages of friendship and goodwill were exchanged between the two Melbournes.

F. RODGERS (Derby).

The old watermill at Melbourne, Derbyshire. Photograph by F. Rodgers, Derby.

A SWISS AERIAL ROPEWAY TRIP

In Switzerland there are many aerial railways, and one of the best known of these is the Gerschnialp-Trübsee cableway. It is reached by a funicular railway that climbs the first steep slope from Engelberg to Gerschnialp. For the further climb a change is made into the cabin of the aerial rope railway, which swings out into the open and reaches an altitude of 5,900 ft. in 15 min. The powerful electric motor driving the cars is placed at the bottom of the ropeway. There are two cars, and wire ropes pass from one cabin, over a drum at the top, and down to the other. Thus when one car is up, the other is down. They travel at roughly 10-15 m.p.h., and at the middle point of their climb they are about 300 ft. above the ground. It is a wonderful experience to be swung out into space on this fascinating trip.



The aerial ropeway from Gerschnialp to Trübsee, Switzerland. Photograph by A. Gulati, London.

From Trübsee there is a fascinating chair railway up to Jochpass. This is a continuous ropeway having 94 chairs fastened on to it, travelling at 5 m.p.h. It is 2 miles long, and does not stop while in operation, so one has to be nippy to get into a chair in time.

A. GULATI (London S.W.11).

A JOURNEY ON THE "ORANGE EXPRESS"

When I arrived at De Aar station in the early morning to join the Orange Express on its way to Durban, I was informed that she was 25 min. late. Waiting there on a cold winter's morning did not improve my opinion of the train, but when she did arrive I had to admit she was a beauty. The saloons and articulated units were painted orange-yellow from the bottom of the windows upward and reddish-brown downward. On the smoke-box door of the engine was a shining disc bearing the words "Sneltrein Orange-Orange Express." This disc is transferred whenever a new engine is coupled up, and at De Aar a 23 Class engine replaced the Beaufort West 15E that had brought the train in.

The "*Orange Express*" is a luxurious train. Each 1st Class compartment has four bunks for sleeping, and the two top ones can be folded away when not in use. A wash basin with hot and cold water, heater, perfumed soap and ash trays also are provided.

At Kimberley a new engine was coupled up and we were running to schedule when we pulled into Bloemfontein station, where yet another locomotive change was made before we went to Kroonstadt.

Going back to my compartment after dinner, a splendid one that could be compared with the best of any hotel, I hired bedding for the night and after the bedding boy had made my bed, I was soon in dreamland. Next morning I awoke after a peaceful sleep to find that an electric unit had replaced the steam engines at Ladysmith during the night. On arriving at Durban I alighted feeling fresh as a daisy after my 751-mile trip. This luxury train has the same fares as an ordinary passenger train and I was really sorry that my journey was ended.

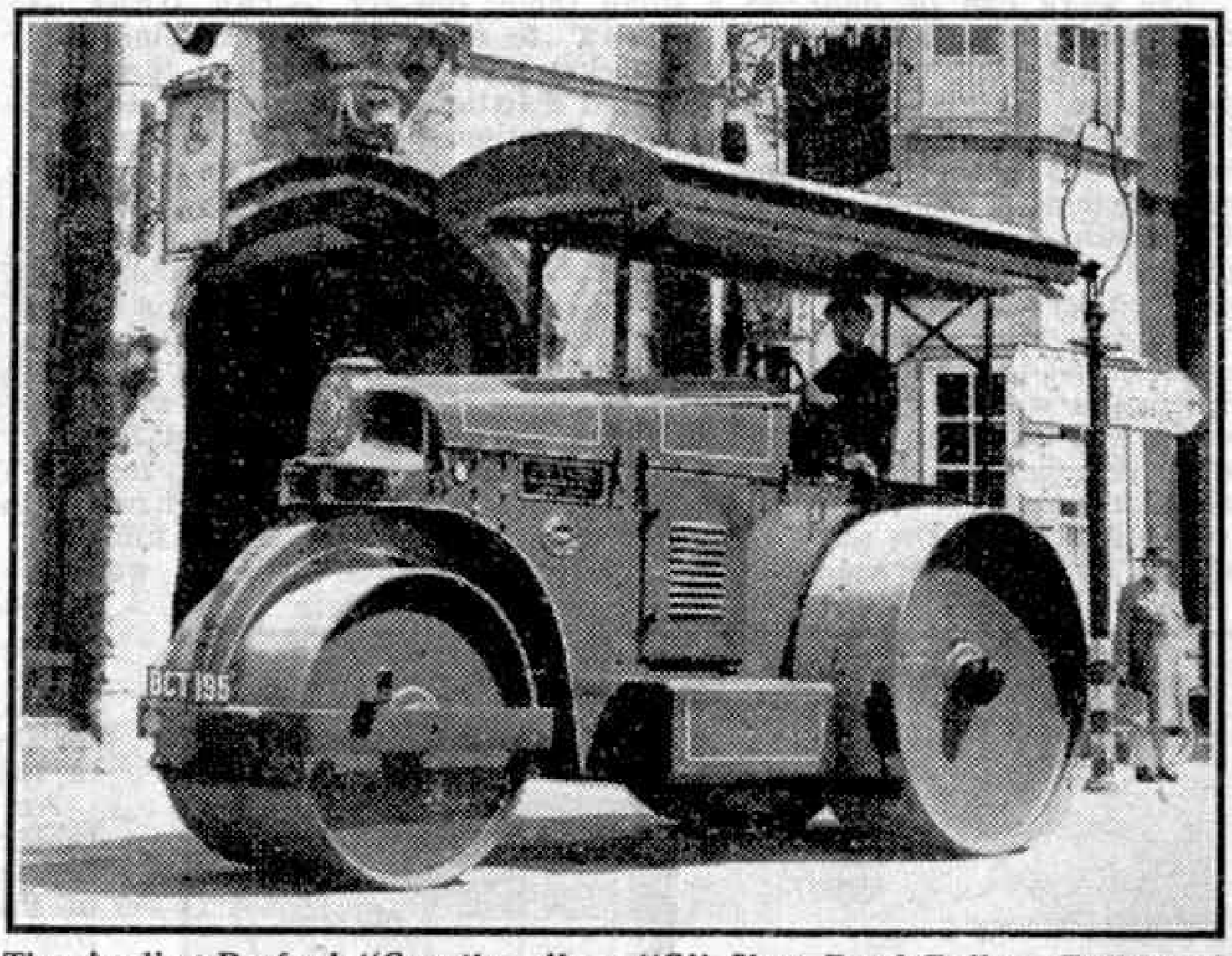
T. JAKOBSEN (De Aar).

A Modern Road Roller

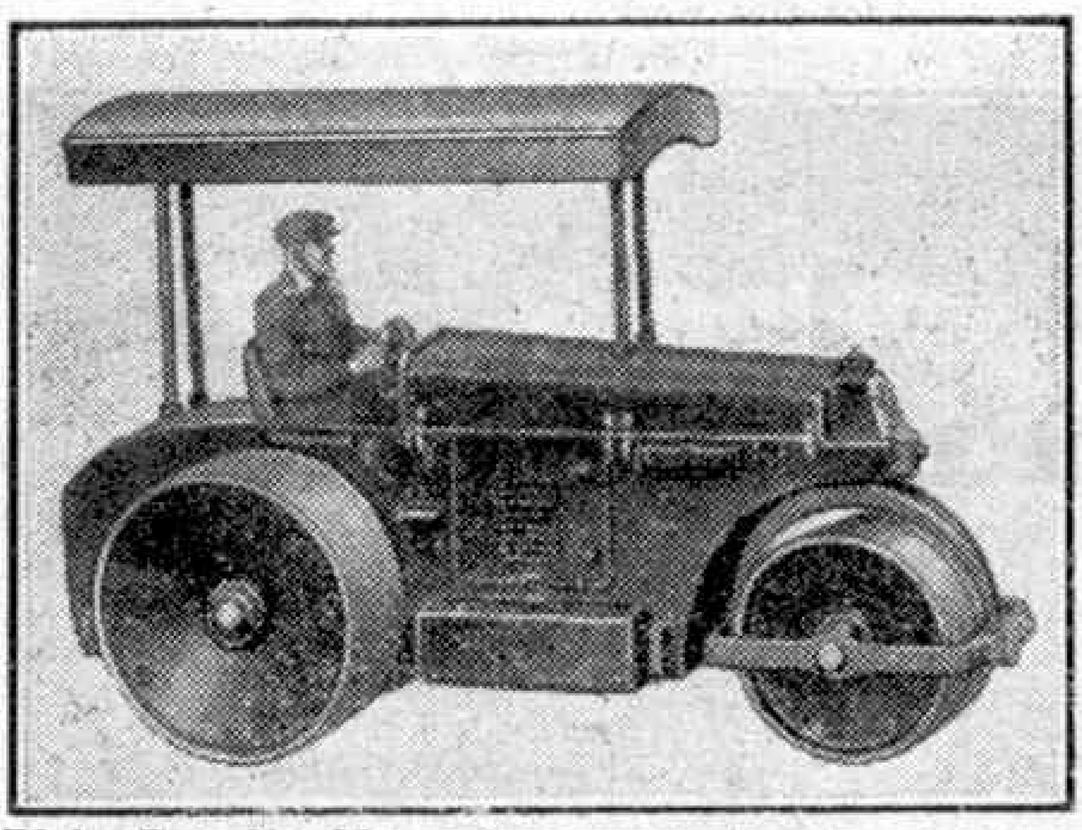
ROAD rollers have always been great attractions. From the first cumbersome steam rollers down to the modern diesel-engined vehicles equipped with ingenious devices of all kinds, few of them have ever run backward and forward to smooth out a stretch of road without being watched by a group of interested onlookers.

One of these modern diesel rollers is illustrated on this page. It is made by Aveling-Barford Ltd., Grantham, a firm with a great tradition in this field, for it was formed by the union of two pioneer concerns in the production of traction engines and rollers. One of the two was founded by Thomas Aveling, whose inventive genius earned him the title of the "Father of the Traction Engine," and the other by William Barford, whose company built the world's first motor roller in 1905, and was responsible for the first high speed diesel roller, built in 1927. The two firms amalgamated in 1934, and to-day Aveling-Barford Ltd. produce a wide range of products in addition to rollers.

Modern roads require two kinds of rolling. One of these is intended to consolidate the material of which the road is made, and a roller to do this must have most of its effective pressure concentrated on the two rear rolls. The other is to give a smooth surface, and for this purpose the pressure is distributed as evenly as possible over the front and rear rolls. Now Aveling-Barford Ltd. have introduced a new type, the "Grantham" or "G" class, which can be used for both purposes. This has a movable weight, contained within the main chassis members, that can be transferred to a forward or rear position at will by simply turning a handle.



The Aveling-Barford "Grantham" or "G" Class Road Roller. Rollers of this type can be used for both consolidating road material and smoothing its surface. Photograph by courtesy of Aveling-Barford Ltd.



Dinky Toys No. 25p., a fine reproduction in miniature of the Aveling-Barford "G" roller illustrated above.

This very fine modern diesel roller has its counterpart in the Dinky Toys series in the recently produced No. 25p, illustrated at the foot of this page. Comparison of this photograph with that of the real roller above shows how wonderfully realistic and true to its original this new Dinky Toy is. It is brightly coloured, and every detail is faithfully reproduced. A particularly attractive feature is the ratchet steering mechanism here used for the first time in a Dinky Toy. The front roller can be turned through a wide angle into a number of different positions on each side of the centre. In each of these it is set automatically by means of this ingenious mechanism. Thus the roller can be made to follow any one of a variety of curved paths as it is pushed along. The entire vehicle runs smoothly on its large rollers and its divided front roller allows it to turn easily so that it can be used with splendid realism for actual rolling in miniature.

Photography

Table-Top Pictures

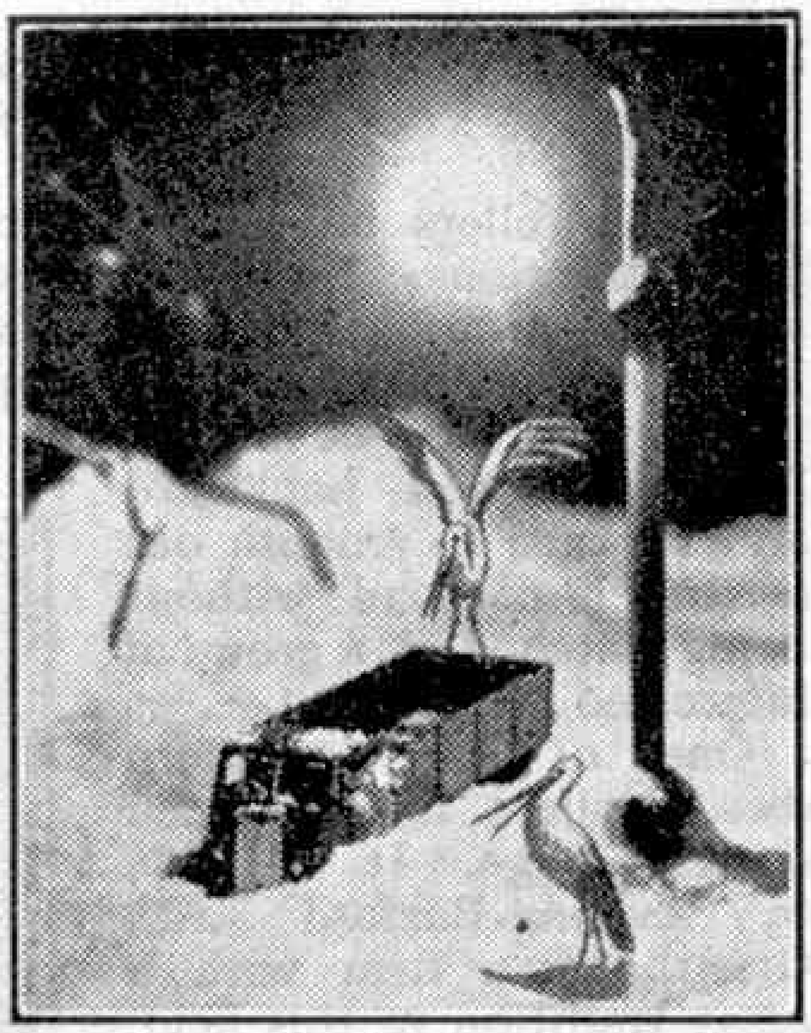
READERS who have not yet experimented with what is known as "Table-top" photography can have no idea of the realistic effects that can be obtained with simple materials.

The work can be done on a small table, but for most purposes a board about 18" × 12" to serve as a stage is better, together with a background of the same size. The board should be tilted a little so as to give the rear a slightly higher elevation. For interior scenes the background may consist of a buff card bearing a rough sketch of the wall of a room. For outdoor scenes a background of some suitable picture rather larger than the scene to be photographed serves splendidly.

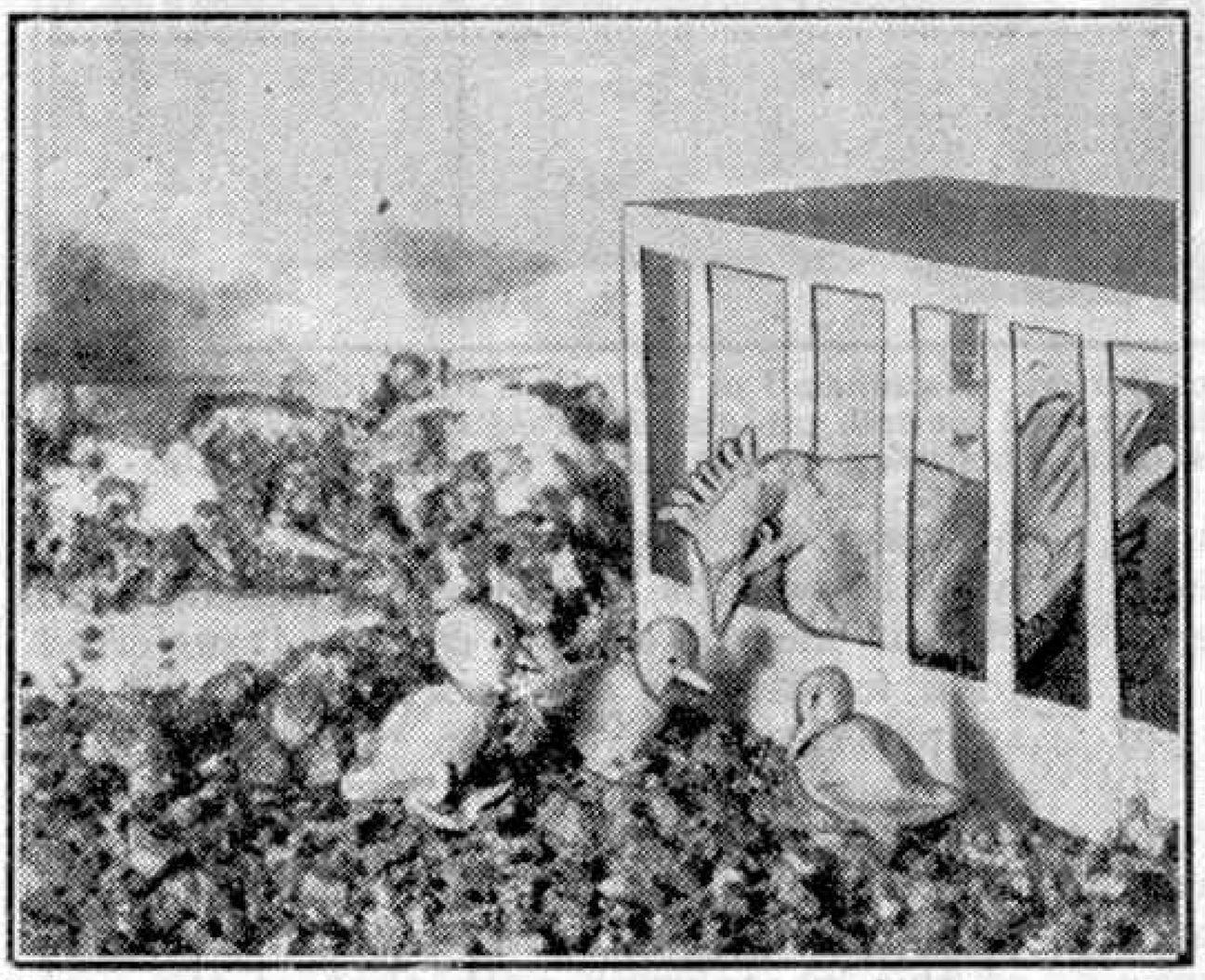
For this kind of photography the camera must be used close to the subject. Cameras with double extensions will rack out sufficiently to allow close-up work, but box-form and other non-focussing cameras will require a supplementary lens or portrait attachment.

The lighting of the scene requires different arrangements for different scenes, and only general hints can be given. If the scene is to be photographed by daylight the stage should be brought close to a window, so that the light is at one side but slightly in front. With artificial light, which is usually more convenient, the stage should be placed almost directly underneath the main light, and it is desirable to have a second and less strong light to one side and slightly at the front of the scene to avoid flat lighting.

The picture "The Driver's Nightmare" was taken by the light of a miniature torch bulb, fixed in a lamp standard built up from scrap materials. The exposure given was five minutes at F8, using fast panchromatic film. Snow was represented by salt sprinkled on cotton wool, and the background was a sheet of plain black paper folded to form two sides of a square. A Dinky Supertoy lorry served for the vehicle and a few twigs were placed in the background to represent trees.



"The Driver's Nightmare." This picture was taken by the light of a miniature bulb fitted to the lamp standard.



"Happy Family." Ashes, Plasticine and cardboard were the materials used.

An example of the use of Plasticine in table-top work is seen in the picture of the hen and chickens. The birds were moulded in Plasticine. The hen coop was cut out from cardboard, and the ground was represented by ashes from the kitchen grate. A piece of mirror was used for the pool.

"Greeting" is another example of the realistic effects obtained by a combination of salt and cotton wool to represent snow. The figure of the man was built up on a wire frame, scraps of cloth being used to form his clothes. The head was moulded in Plasticine and stuck on the wire frame before the clothes were fitted.

Practically any kind of scene can be reproduced in a table-top and the scope is limited only by the photographer's skill and ingenuity in arranging his materials. It is a good plan to keep a look out for "odds and ends" that can be used in making up scenes, and every home will produce plenty of "bits and pieces" suitable for this work.

"Greeting." A realistic snow scene.

Club and Branch News

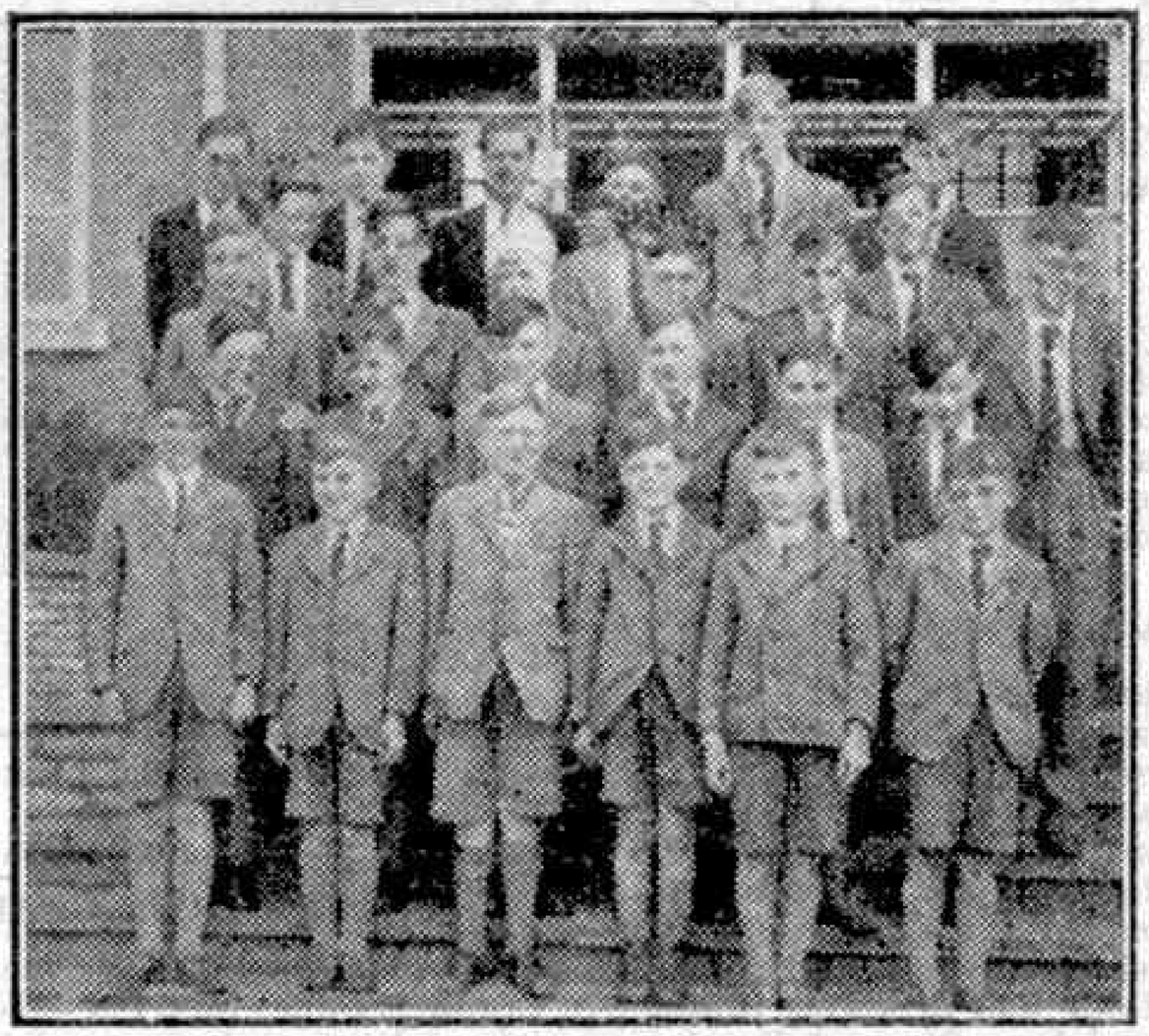
WITH THE SECRETARY

PLAN FOR PUBLICITY

Now the special meetings and social events associated with the Christmas and New Year season are over, it is possible to look back upon them, and to form some idea of their effect on Guild and Branch progress. The signs are very encouraging. Enthusiasm has reached a higher pitch than at any time since the outbreak of the war, and during the past few weeks there has been a real flood of applications for membership of the Guild and the H.R.C. Every one of these newcomers is a possible recruit for some Club or Branch, and no effort should be spared to make sure that as many as possible of these are brought into the circle.

The best recruiting agent for any organisation is a satisfied member, who can explain exactly what is done at Club or Branch meetings and can bring his friends along to join in the fun. A special point therefore should be made of asking all members to do what they can in this direction. It is advisable to arrange some special form of publicity in addition, however, as there may be likely members who are not already in touch with boys who have already joined. In an excellent scheme operated by the Norbury M.C. printed postcards have been distributed that give details of the Club and of its meetings, and explain exactly how to get in touch with the secretary. The cards also extend an invitation to a Club meeting to all who are interested, and there is no doubt that the publicity that the Club will achieve with their aid will help to strengthen it.

Postcards of this kind must be made attractive, and special attention has been given to this point in the Norbury M.C. The cards are well printed and good use has been made of illustrations showing models being constructed. I was very glad to forward a selection of small blocks suitable for this purpose to Mr. Chapman, Leader of the Club, and I shall be pleased to loan similar blocks to Meccano Clubs and also to Branches of the H.R.C. They will be found suitable for many other purposes, such as Club stationery, programmes of Exhibitions and other special events, and Club and Branch Magazines.



Members of the Worcester College for the Blind M.C. Mr. R. D. Follett, Leader, is third from the left in the back row, with K. Peak and M. Griffin, joint secretaries, on his right. This Club was affiliated in March 1944. Model-building and other contests are the chief features of the programme, which also includes talks and visits to local works and factories.

RECENTLY INCORPORATED BRANCHES

No. 501. SLOUGH—Mr. H. Kelly, 64, Hatton Avenue.
No. 502. STROUD—Mr. C. T. Hargest, 6, Folly Lane.
No. 503. WEYMOUTH & DISTRICT—Mr. H. J. Brown, Creekmoor, 68, Wyke Road.
No. 504. RYDAL SCHOOL—Rev. H. F. Matthews, Rydal School, Colwyn Bay.

CLUB NOTES

MERCHANT TAYLORS SCHOOL (GREAT CROSBY) M.C.—Entries in a Model-building Contest were inspected by the Headmaster, who was very pleased with them. Recruiting has been very successful and members are showing great keenness. Visits to industrial works have been planned. Club roll: 93. *Secretary:* C. Domville, 3, Sefton Road, Litherland, Liverpool 21.

HORNSEA M.C.—Excellent meetings continue, special programmes being arranged for each section. Talks have been given on "*Gardening*," "*Astronomy*" and "*Geology*," and during the Christmas Season Games and other Social events were organised. The special Section for "Holiday Members" was given a Film Show. Club roll: 55. *Secretary:* D. Kitching, 25, Clifford Street, Hornsea.

MINEHEAD GRAMMAR SCHOOL M.C.—Meetings in the ex-A.T.C. hut have continued. Model-building competitions with set subjects have been successful, the entries being judged on the time required to build them as well as construction. Club roll: 17. *Secretary:* B. Watts, Carfax Cottage, Old Cleeve, Watchet.

SOUTH AFRICA

MALVERN M.C.—The Club has been reorganised, with Mr. E. W. Sykes as Leader and K. E. Tanner as Acting Secretary. Meetings are held in the Malvern Methodist Church Hall. A Christmas Party was arranged for the children of the Epworth Homes. A special recruiting drive to attract new Junior members has been arranged. Club roll: 20. *Secretary:* Mr. K. E. Tanner, P.O. Box 8, Cleveland, Johannesburg.

BRANCH NEWS

NORBURY—Good progress is being made with the special Recruiting Campaign. Visits to places of interest have included one to the Royal Naval Museum at Greenwich, and a walk through Blackwall Tunnel. An Episcope has been purchased. Film Shows have been given and special Christmas events were a Party and visit to a Circus. *Secretary:* P. A. Knight, 17, Linden Avenue, Thornton Heath.

STROUD—A Branch Party was held during November. Film Shows also have been arranged and a Quiz has been enjoyed. Excellent Track Meetings are held, and larger layouts, giving greater opportunities for interesting running, are being arranged. *Secretary:* D. Hargest, 6, Holly Lane, Stroud.

WEYMOUTH AND DISTRICT BRANCH—Additions to the Branch layout are being made each week. Lineside Accessories have been constructed by members, who are now building an Engine Shed. *Secretary:* A. J. Brown, 68, Wyke Road, Weymouth, Dorset.

Among the Model-Builders

By "Spanner"

A CABLE-OPERATED BRAKE

Last month I mentioned a method of using Spring Cord in the construction of control cables for the winding mechanism of a remote controlled crane. This mechanism aroused considerable interest among model-builders, and in response to several requests for further application of such cables, I am describing this month a ratchet brake mechanism operated on similar lines. This is shown in Fig. 1, and it will be found specially suitable for use in any model where there is insufficient space to fit the more usual rod-operated brake.

A Pawl is locked on a 2½" Rod 1 that is mounted between side-plates. The Pawl engages the teeth of a Ratchet Wheel 2, and is held in the "on" position by a Spring 3. One end of the Spring is fitted over a ½" Bolt fixed in the threaded hole of the Pawl, and its other end is bolted to one of the side-plates.

The ends of the Spring Cord are fixed in a Coupling 4 and in a Collar held by the Bolt 5. A length of piano wire forming the core of the cable is fastened to the Pawl and also to a Coupling 6, which is locked on a 3½" Rod fitted with a Crank 7. An Angle Bracket is bolted to the Crank to represent a foot-pedal.

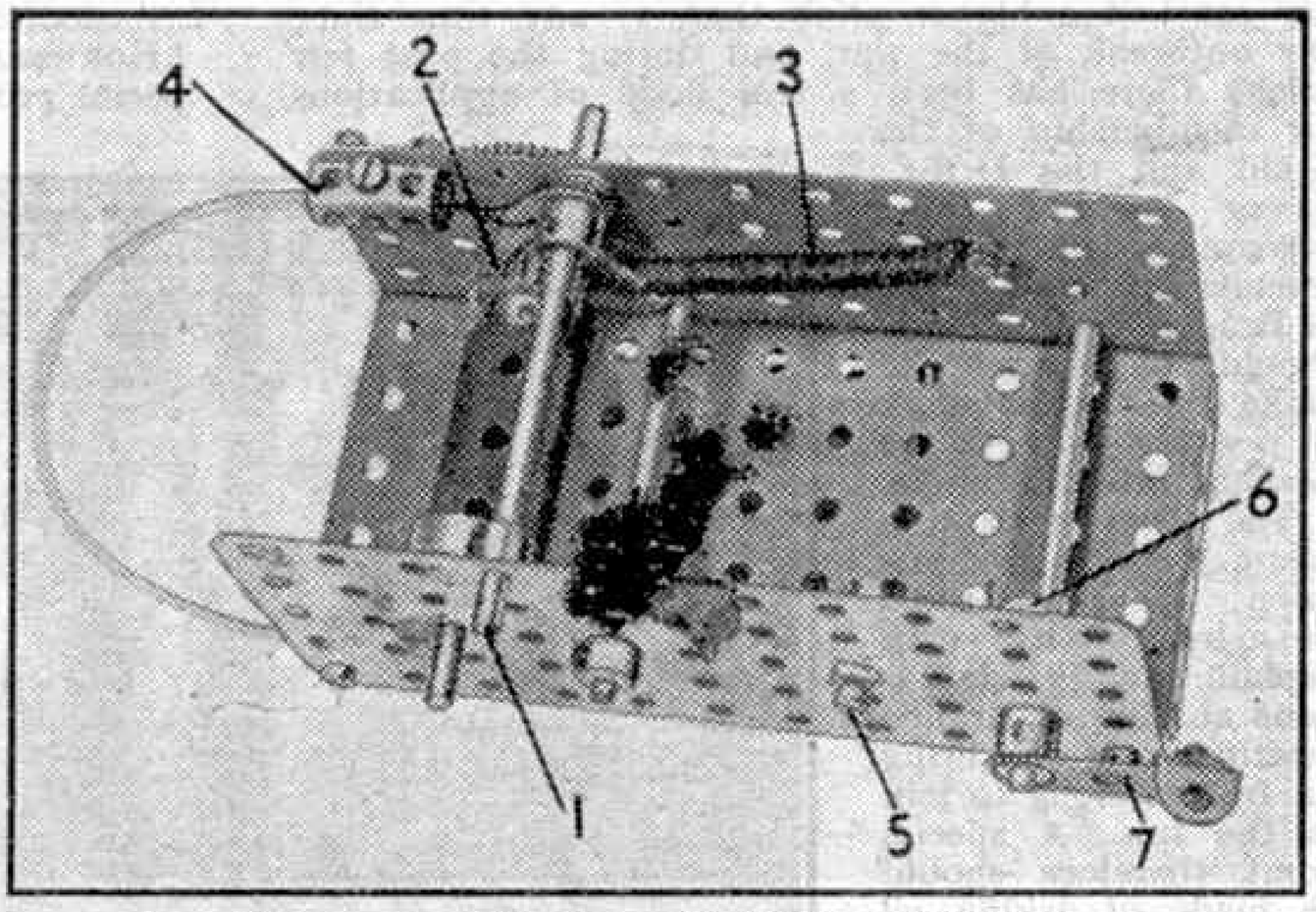


Fig. 1. A cable-operated brake mechanism.

A SIMPLE REVERSING MECHANISM

Fig. 2 illustrates a simple device that will be found useful in many models where some form of reversible drive is required. It also provides a reduction ratio of 3:1 in both forward and reverse directions.

To construct it a 4" Rod 1 is passed through holes in a Channel Bearing bolted to a 5½" × 2½" Flanged Plate. This Rod is free to slide endways in the holes, and carries a ½" Pinion and one half of a Dog Clutch. A 3½" Rod 2 is also mounted in a Channel Bearing, but this one is fitted with a ½" Pinion and the other half of the Dog Clutch. This Rod is held in its place by a Collar, which is positioned on the Rod so that the ½" Pinion is kept in constant mesh with a 1½" Contrate 3 that is fixed on the output shaft of the mechanism.

The Rod 1 can be moved endways by means of a 2½" Strip, which is lock-nutted to an Angle Bracket bolted to the base. A Bolt fixed in the next-to-end hole of the Strip engages between two Collars locked on Rod 1.

Forward drive is obtained by sliding Rod 1 so that its ½" Pinion is brought into mesh with the Contrate 3. Reverse drive is obtained by sliding the Rod so that the halves of the Dog Clutch are engaged.

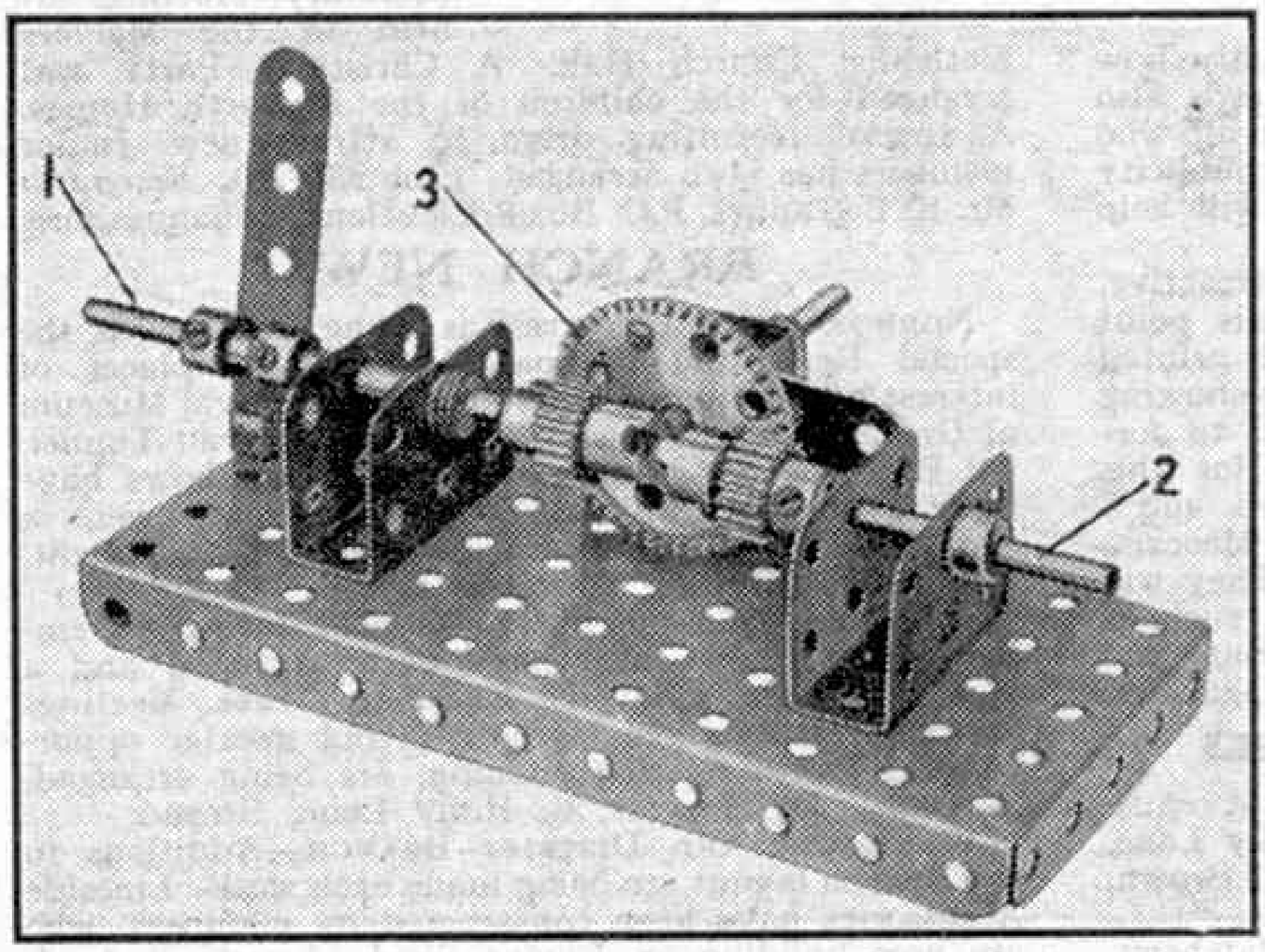


Fig. 2. This simple reversing mechanism requires only two Pinions and a Contrate Wheel.

HOW TO USE GEARS AND PULLEYS

When a model is driven, either by hand from a Crank Handle, or by a Clockwork or Electric Motor, its realism and successful working depends to a very great extent on the form of driving gear employed. For example, if only a small amount of power is needed as in the case of a small windmill, the model may be driven direct from the Crank Handle or from the driving spindle of the Motor, or through a belt running over two pulleys of the same diameter. These will give what is known as a 1:1 (one-to-one) ratio. Greater power can be obtained by incorporating different sizes of pulleys or gears, which will have the effect of reducing the speed of the drive but will give corresponding increase in the output power. In the simplest method this increased power can be obtained by connecting a small pulley on the Motor to a larger pulley on the driving shaft of the model. Thus if a 1" Pulley is made to drive a 3" Pulley, a reduction ratio of 3:1 (three-to-one) is obtained. This means that the driven shaft will take about three times the load that the motor shaft would handle directly, but will rotate at only one third of the speed.

This matter of pulley and gear ratios is of great importance, and as my correspondence shows that many younger model-builders are not quite sure of the uses of the various ratios obtainable, I am giving the following details which will, I hope, help to make matters more clear.

Figs. 3 and 4 show examples of several

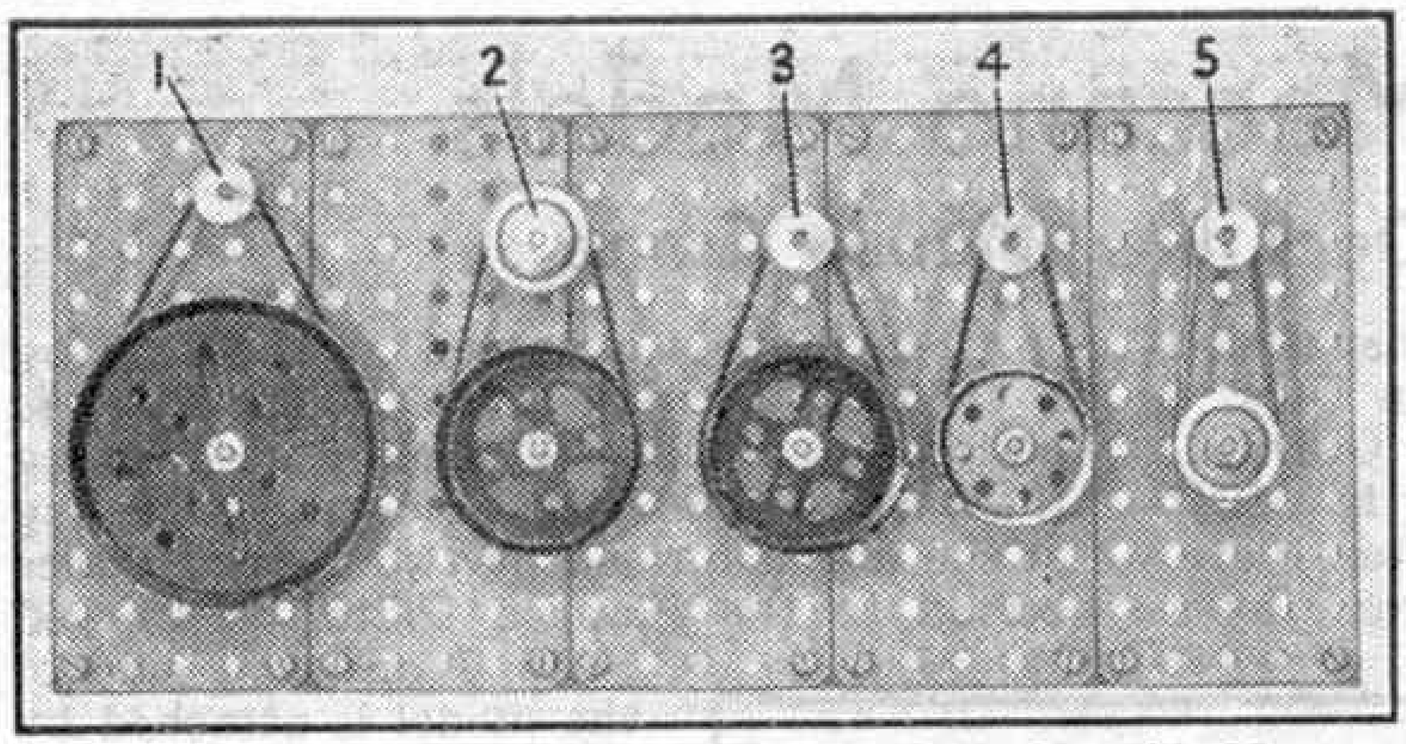


Fig. 3. Examples of various speed ratios obtainable with Meccano Pulleys.

of the more useful ratios that are possible, though these by no means exhaust the range of available combinations. By combining two or more of these ratios in a train, an almost infinite variety of final ratios can be obtained.

Fig. 3 illustrates useful ratios obtained by using pulleys of various sizes connected by driving belts. The first shows a ½" Pulley 1 and a 3" Pulley, and provides a ratio of 1:6. Following this are a 1" Pulley 2 and a ½" Pulley 3 connected to 2" Pulleys, giving ratios of 1:2 and 1:4 respectively. Finally ½" Pulleys are shown connected to a 1½" and a 1" Pulley respectively, giving ratios of 1:3 and 1:2. It should be noted that the ratios obtained by using pulleys are approximate, as the diameter of the pulleys is measured to the outside of the groove.

When a Clockwork or Electric Motor is used to operate a model it is usually necessary to introduce some form of reduction, and it should be a simple matter to select a suitable ratio from those illustrated.

In certain hand-operated models it will be found convenient to increase the speed of the Crank Handle. This can be easily effected by fixing a large diameter gear or pulley to the Crank Handle and connecting this to one of smaller diameter on the model driving shaft.

The first example marked 1 in Fig. 4 gives a ratio of 1:7 and is formed by a ½" Pinion 1 meshed with a 3½" Gear. Following this is a 1:5 ratio obtained by using a ½" Pinion 2 and a 2½" Gear. The next two ratios are 1:3 and 1:2, formed by a ½" Pinion 3 and a 57-teeth Gear, and a ½" Pinion 4 and a 50-teeth Gear respectively. The last example gives a ratio of 1:1 obtained by meshing together two 1" Gears. At the top of the panel a Worm Wheel 5 is shown meshed with a ½" Pinion, giving a 19:1 ratio. This last combination is not reversible.

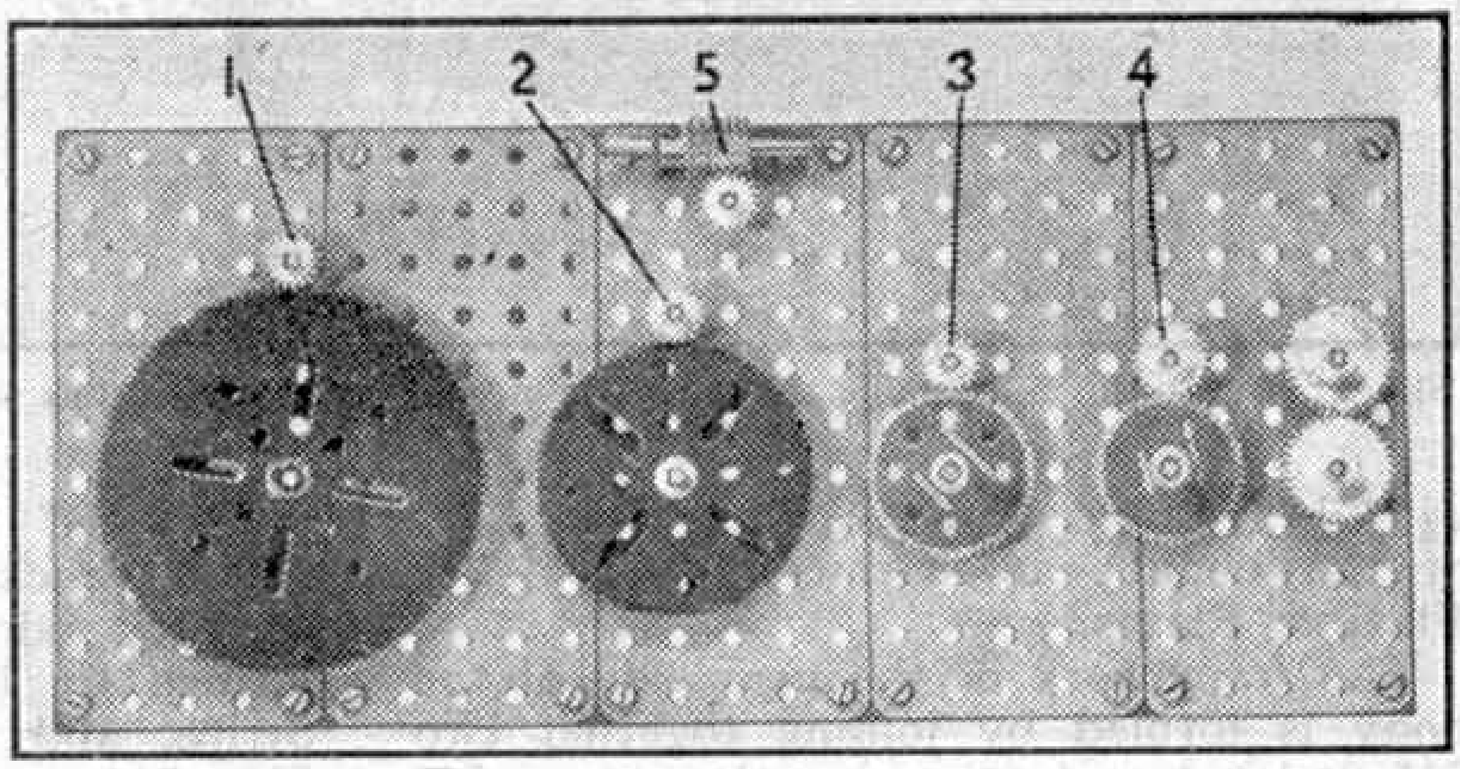


Fig. 4. Some standard combinations of Meccano gearing.

A FINE COMPETITION FOR ALL MECCANO BOYS

Every Meccano boy should enter the model-building competition announced here, for there is every possibility that he may win one of the fine prizes offered. All that is necessary to take part in the contest is to build a Meccano model. This may be of any type, and the only condition is that it must be the competitor's own unaided work. Every "*M.M.*" reader is eligible to compete in this contest, no matter what his age may be.

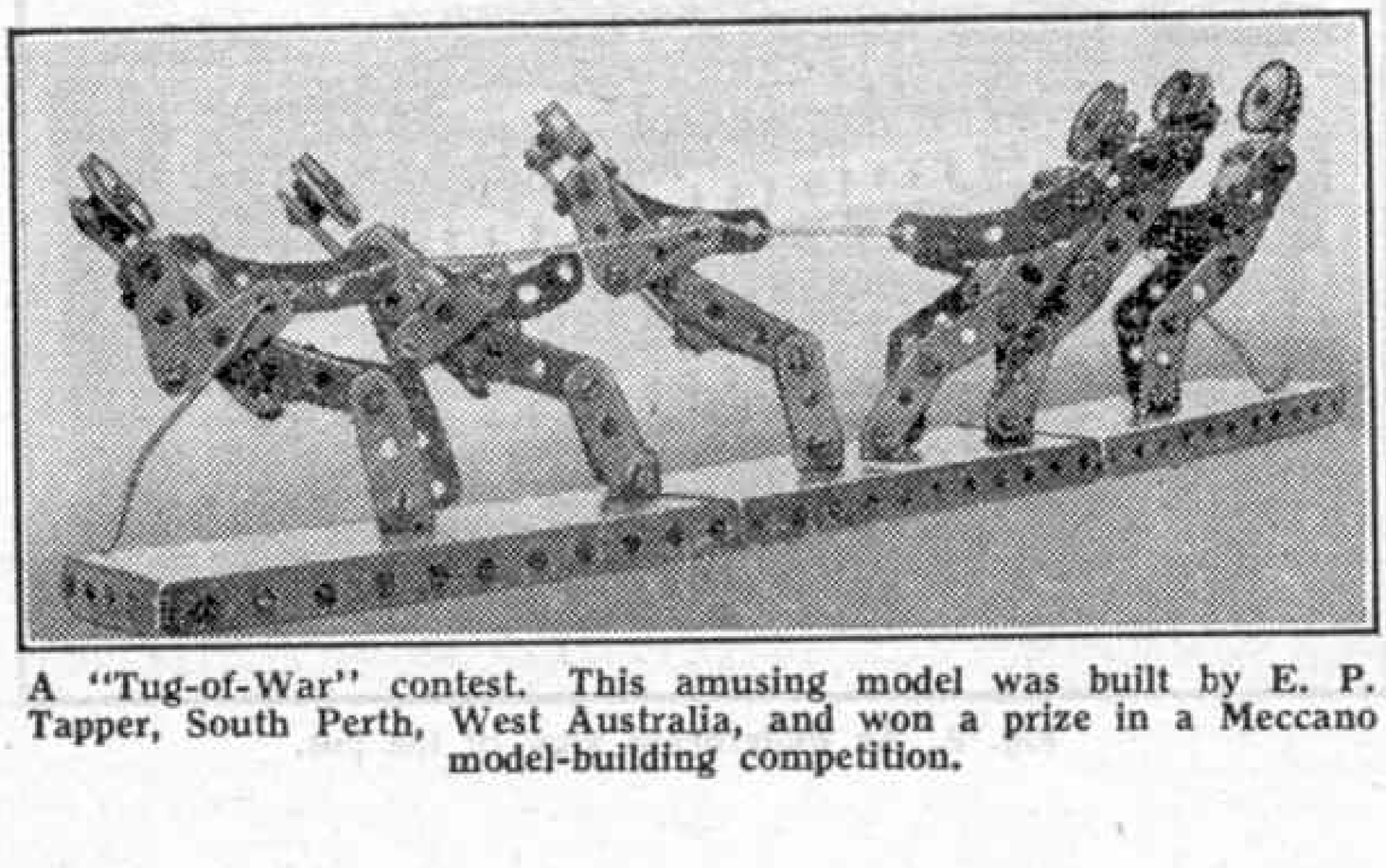
Any size of Outfit may be used in building the model, but good workmanship and constructional details that show ingenious uses for Meccano parts, will attract the attention of the judges far more than the mere size of a model.

After the model is built the next job is to obtain a suitable illustration of it. This should be a photograph, but a sketch will do quite well if a good photograph is impossible. The competitor must write his age, name and address on the back of the illustration and enclose it, together with a brief description of the model, in an envelope addressed "*February General Model-building Contest, Meccano Ltd., Binns Road, Liverpool 13.*"

Entries will be grouped into two Sections, one for competitors living in the British Isles and the other for Overseas competitors. Those from competitors in the British Isles may be sent in at any time up to 31st March. Entries from readers living Overseas will be accepted until 30th June.

The following prizes will be awarded in each Section for the best built and most interesting models received. First, Cheque for £2/2/–; 2nd, Cheque for £1/1/–; 3rd, P.O. for 10/6. There will be also five consolation prizes of 5/– each and Certificates of Merit.

It should be noted that successful entries become the property of Meccano Ltd., but photographs or sketches of unsuccessful models will be returned to senders provided that a stamped addressed envelope of the necessary size is enclosed with the entry for that purpose.



A "Tug-of-War" contest. This amusing model was built by E. P. Tapper, South Perth, West Australia, and won a prize in a Meccano model-building competition.

New Meccano Models

Single Deck Bus—Mobile Crane

ALL the parts used in the construction of the motor bus shown in Figs. 1 and 2 are contained in a No. 5 Outfit.

The chassis is made by bolting two 12½" Angle Girders to a Flanged Sector Plate, and then joining these, at the rear, by a 2½" × 2½" Double Angle Strip. The sides of the bonnet are formed by 2½" × 2½" Flexible Plates.

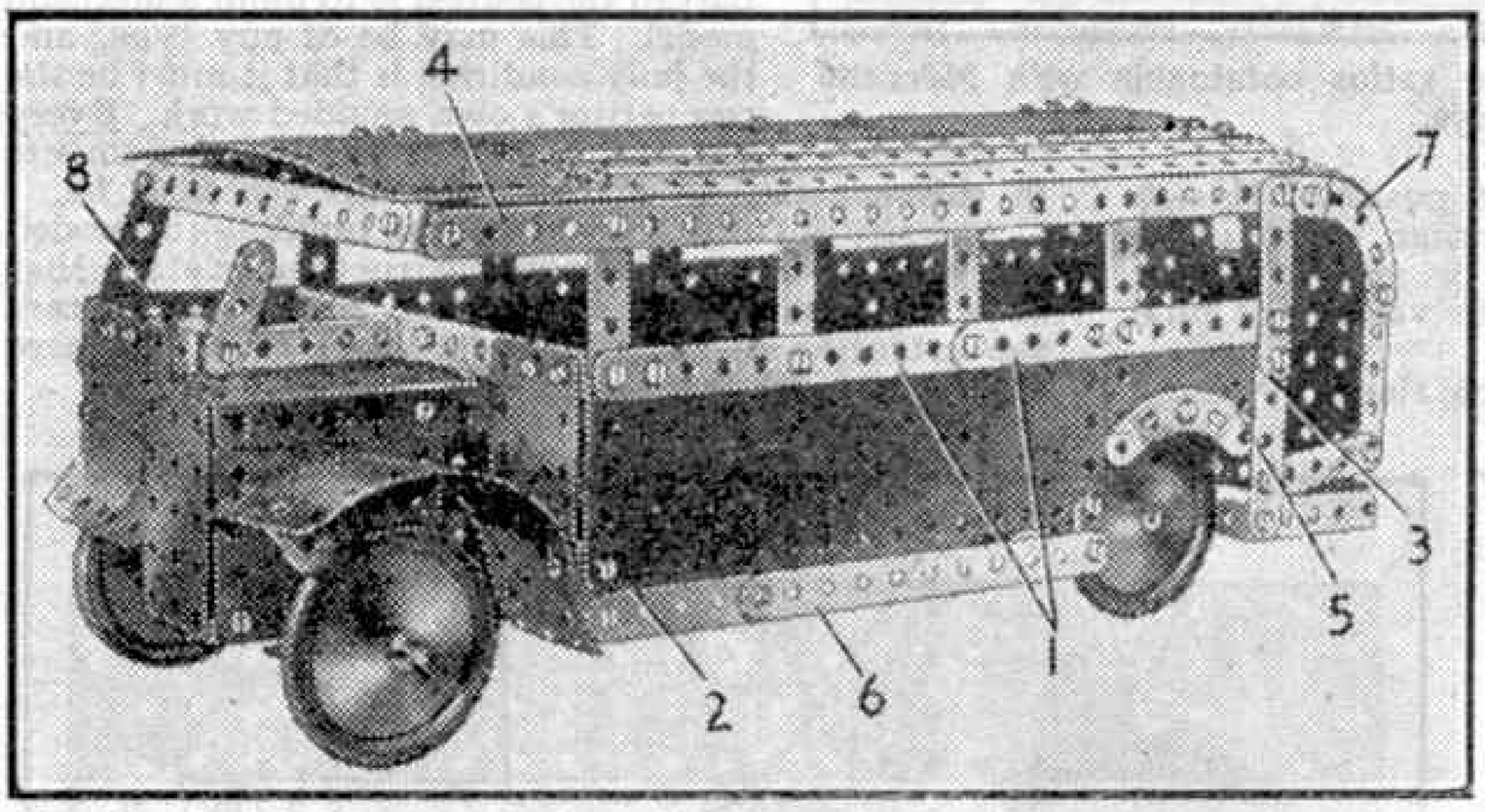


Fig. 1. Outfit No. 5 contains all the parts needed to construct this fine motor bus.

The framework of the near side of the body is formed by joining together two 5½" Strips 1 and attaching these to a 5½" Strip by a 1" × 1" Angle Bracket. The Strip is fastened to the top of the bonnet by an Angle Bracket. A compound Strip 3 consisting of two 2½" Strips joined together is bolted to the rear end of the Strips 1 and to a 12½" Strip 4, which is connected to the front end of the Strip 1 by a 2½" Strip. The window frames are represented by 2½" Strips and 2½" × ½" Double Angle Strips bolted to the Strips 1.

The near side is filled in by a 5½" × 2½" Flexible Plate, half of a Hinged Flat Plate and a 5½" × 1½" Flexible Plate 5. Two 5½" Strips 6, overlapped eight holes, are attached to the side by Fishplates. Construction of the off-side of the body is similar, except that a 12½" Strip is used in place of the Strips 1 and the panelling is extended at the rear by a 2½" × 2½" Flexible Plate. This Plate is bolted to a 5½" × 2½" Flanged Plate forming the back of the bus. The curved panelling at the rear is formed by two Curved Plates bolted to the Flanged Plate. A Curved Strip 7 on each side of the model is attached by a Fishplate to the 12½" Strips 4. The 5½" × 2½" Flanged Plate is connected to the rear of the chassis by a 2½" × ½" Double Angle Strip.

The side of the driver's cab consists of a 2½" × 1½" Flexible Plate, and is attached to the off-side bodywork by a 3½" Strip. The front of the cab is formed by two 2½" × 1½" Flexible Plates overlapped two holes and fastened to a 2½" × ½" Double Angle Strip 8.

Two 5½" Strips are bolted to Obtuse Angle Brackets fastened to the Strips 4 on each side. The sides of the roof are formed by 12½" Strips bolted to the 5½" Strips, and the centre is filled in by a 5½" × 2½" and two 4½" × 2½" Flexible Plates. These are fastened to 12½" Angle Girders bolted to the 5½" Strips. A 5½" × 2½" Flexible Plate forms the cab roof, and a 5½" × 1½" Flexible Plate is clamped under the ends of the 12½" Strips and bolted to the Curved Plates at the rear.

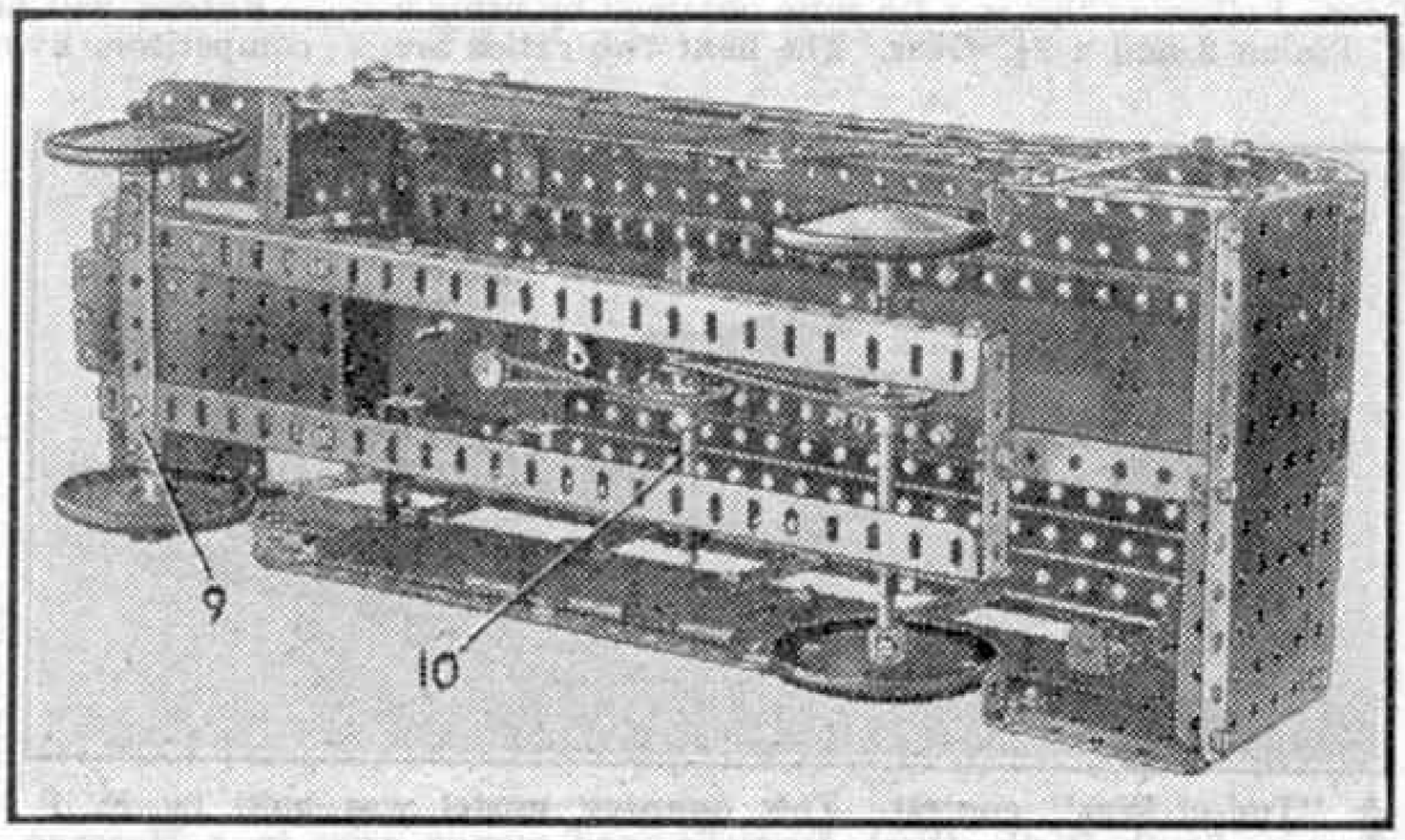


Fig. 2. An underneath view of the bus.

The front wheels are mounted on 1½″ Rods journalled in Angle Brackets fixed to a 3½″ Strip 9, and in the chassis members. The rear wheels are locked on a 5½ Rod mounted in the chassis.

A *Magic* Motor is bolted to the chassis, and drives a 1″ Pulley on a 3½″ Rod 10. A ½″ Pulley on this Rod is then connected to a 1″ Pulley on the rear axle.

Mobile Crane

The jib of the simple crane shown in Fig. 3 may be raised or lowered according to the head space available, and may also be used for direct lifting when the lifting wire itself is not strong enough to take the load. A 5½″×2½″ Flanged Plate forms the base and two Flat Trunnions bolted to its flanges support a 4½″ Rod. The bolt that holds these Trunnions also fixes in position a 2½″ Curved Strip. A ½″ Pulley 5 is locked on the rear axle and is driven from a *Magic* Motor bolted under the 5½″×2½″ Flanged Plate. A 3″ Rod is passed through the 5½″×2½″ Flanged Plate and through a 1½″×2½″ Flanged Plate, which is under the front of the model, and is held in place by a Collar. The upper end of the 3″ Rod is fitted with a Steering Wheel, and its lower end passes through a 2½″×½″ Double Angle Strip and is held in a Coupling. Each end of the Coupling carries a 2″ Rod.

Two Flat Trunnions and Trunnions form the radiator, and the bumper is a 3½″×½″ Double Angle Strip. The seat is built up from a Girder Bracket attached to two 2½″×½″ Double Angle Strips. Two 5½″ Strips are joined to the front of the chassis with Angle Brackets and connected to the sides of the Double Angle Strips. A 3½″ Rod is passed through the ends of the 5½″ Strips and held in place by Collars.

The base for the bonnet is made up from two Girder Brackets, the flanges of which support two 2½″×1½″ Flexible Plates. The upper end of the steering rod is supported by a 1½″×½″ Double Angle Strip attached to the Girder Brackets by Fishplates.

The base of the jib superstructure consists of two 2½″×1½″ Flanged Plates, one of which extends the chassis by two holes and supports two 2½″×1½″ Flanged Plates that form the back. The two Flanged Plates at the base are joined by a 2½″ Strip, and the vertical Flanged Plates are connected by two 2½″ Strips. Another 2½″×1½″ Flanged Plate forms the front of the superstructure and is connected to the base by Fishplates. The sides are joined by 2½″ Strips, which are used to support a 3½″ Crank Handle fitted with a Cord Anchoring Spring. The Plate at the back is extended by 1½″ Strips that support a 3″ Axle Rod 1 forming a pivot.

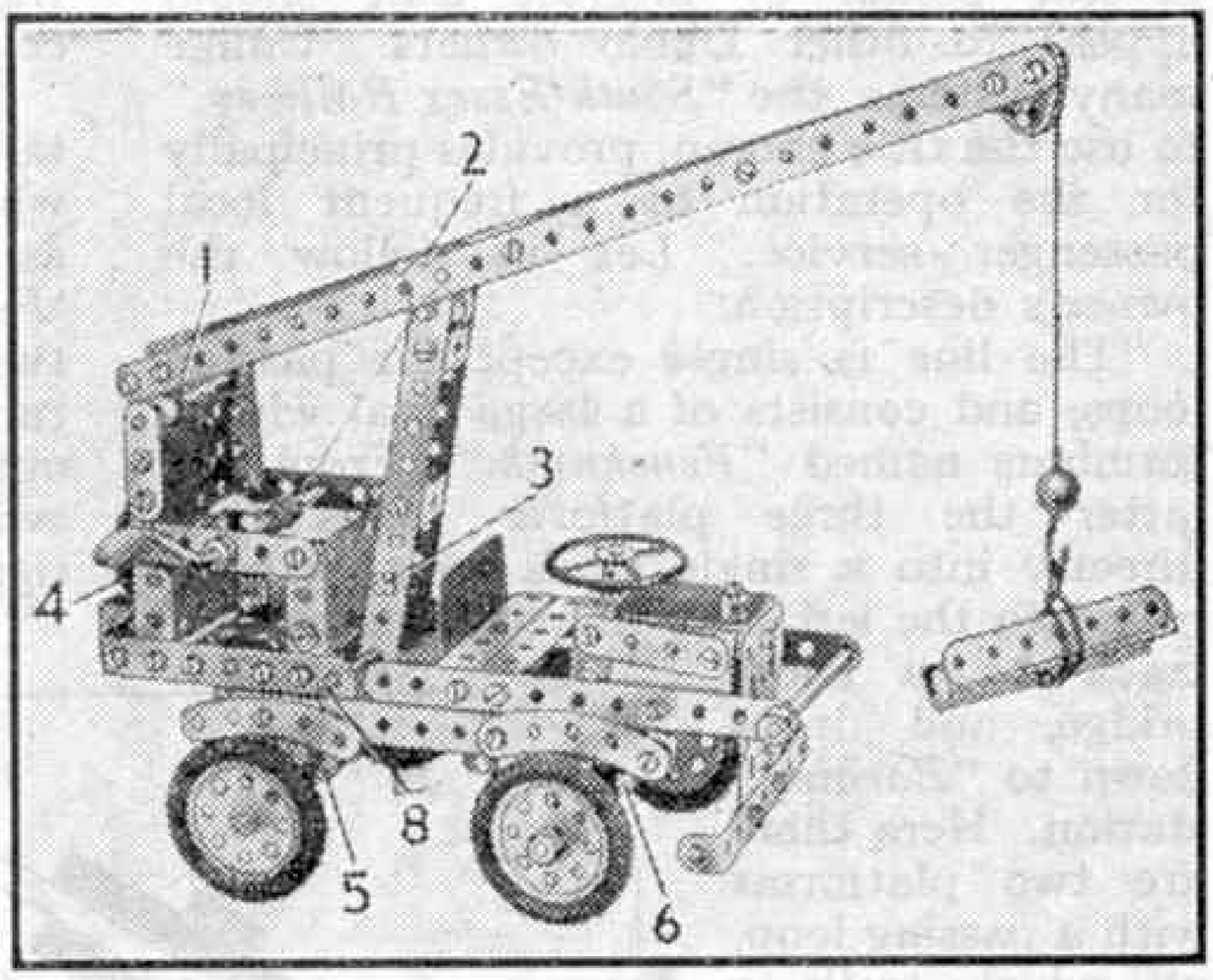


Fig. 3. A novel crane for lifting light loads.

Two 12½″ Strips carrying two Eye Pieces 2, form the jib sides, and are spaced by a 1½″ × ½″ Double Angle Strip, to which are also bolted two 1″ Triangular Plates which are pivoted on the Rod 1. Another two 1″ Triangular Plates are used for the jib head, and they carry a 1″ Axle Rod supporting a ½″ Pulley. A 3½″ Rod 8 supports two 5½″ Strips spaced by Double Angle Brackets. The ends of these Strips are connected to the Eye Pieces by bolts held by Grub Screws.

A Threaded Boss 3 is lock-nutted to the 5½″ Strip and a 1″ Screwed Rod is held in its threaded bore. The Screwed Rod passes through the Flanged Plate and into the thread of a Threaded Coupling. The other end of the Coupling holds a 3½″ Rod, which is passed through the Flanged Plate at the back of the model and held by a Collar.

This Rod holds a Pulley fitted with a Rubber Ring 4 that when turned moves the Rod and screws the Coupling along the Threaded Rod, so moving the jib.

Parts required for the model Crane: 2 of No. 1; 4 of No. 2; 2 of No. 3; 2 of No. 5; 2 of No. 6; 2 of No. 6a; 4 of No. 10; 2 of No. 11; 2 of No. 12; 1 of No. 15b; 2 of No. 16; 1 of No. 16a; 2 of No. 16b; 2 of No. 17; 1 of No. 18b; 1 of No. 19g; 2 of No. 21; 1 of No. 22; 2 of No. 35; 60 of No. 37; 8 of No. 38; 1 of No. 45; 3 of No. 48; 3 of No. 48a; 1 of No. 48b; 2 of No. 50a; 7 of No. 51; 1 of No. 52; 1 of No. 57b; 11 of No. 59; 1 of No. 63; 1 of No. 63c; 1 of No. 64; 4 of No. 77; 4 of No. 90; 1 of No. 124; 2 of No. 126; 4 of No. 126a; 1 of No. 155; 1 of No. 161; 1 of No. 185; 2 of No. 188; 1 *Magic* Motor.

The Hornby-Dublo "*South Essex Railway*"

THE diagram shows the Hornby-Dublo railway of an "*M.M.*" reader, Mr. A. E. Clark, of Rainham, Essex, which has several points of interest that should appeal to other Dublo owners. Unlike many systems, the "*South Essex Railway*," to use the title chosen, provides principally for the operation of a frequent local passenger service. Let us follow the owner's description:

"The line is single except for passing loops, and consists of a large oval with a terminus named "*Fenchurch*." From the latter the three platform roads lead directly into a single track which climbs round to the left over the continuous oval track by a short bridge, and drops down to "*Barking*" station. Here there are two platforms with a passing loop, off which trails a connection to the carriage sidings, a double-road engine shed to hold four locomotives, and a further siding for coal wagons and miscellaneous stock.

"Leaving *'Barking'* the track becomes single again, and then immediately opens out into a triangular junction, on the straight side of which is the single platform of *'Grays.'* The two diverging tracks from the junction carry on to form the main oval on which is situated *'Upminster,'* a station with two platforms and passing loop. Off the lower side of the oval in the diagram is a short spur leading to a riverside wharf, where the 'Company coal' and other supplies are transhipped from barges to wagons.

"The stock consists of five Hornby-Dublo 0–6–2 Tank Locomotives and an 0–4–0 tank of unknown make. There are nine twin-articulated units marshalled into four four-coach trains, with one spare two-coach set. Five wagons, a van and a goods brake van complete the stock. Four of the wagons are for 'Loco coal' while the other three are service vehicles. The latter are normally kept alongside the engine shed with two coal wagons just in front of them. The other two coal wagons are at the wharf, and the spare coaches on the *'Fenchurch'* siding.

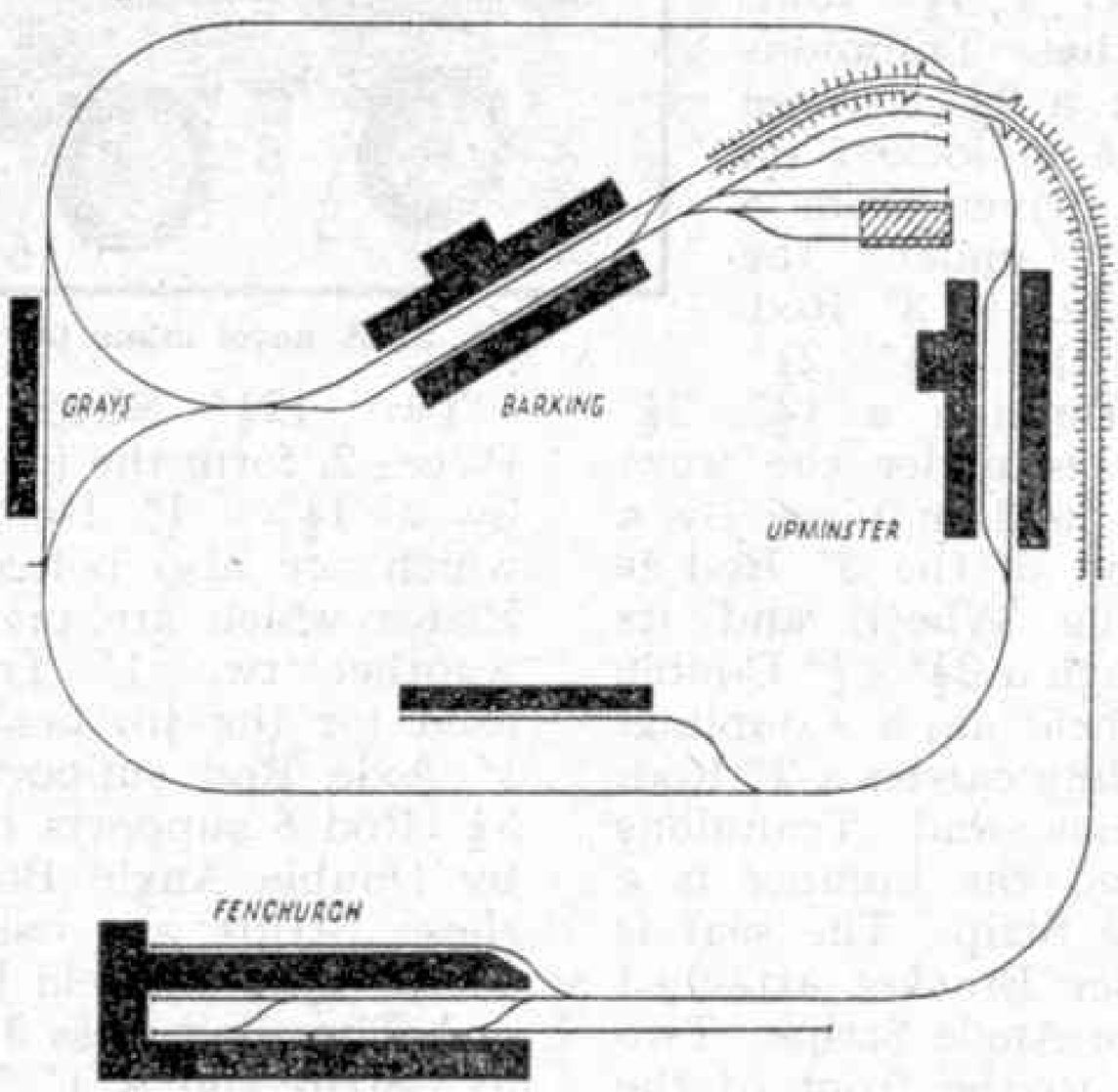
"During 'peak periods' all four 0–6–2 tanks and their passenger trains are in use, while the fifth 0–6–2 waits at *'Fenchurch'* as a turnover engine. Trains run from *'Fenchurch'* to *'Barking,'* then make nearly two complete circuits of the oval before turning back to the terminus. On the outward journey at *'Barking'* trains are switched alternately over the left and right hand roads of the triangular junction.

"Only one train runs during the slack periods, the engine running round its train at the terminus by means of the crossover points provided. The remaining trains are stabled two in the depot and one in the bay platform at *'Fenchurch.'* During the slack periods the two coal wagons are hauled from the depot to the riverside wharf, where they are exchanged for two full trucks.

"The 0–4–0 engine is for emergency only, and when called into passenger service is only capable of hauling four coaches satisfactorily on the level. This necessitates terminating its working out from and back to *'Barking.'* where the train is then shunted into the depot until its turn comes round again.

"The original terminus was at *'Barking,'* this being the reason for the presence there of the depot and the fact that the shed had a capacity of four engines only. When the extension to *'Fenchurch'* was built, one further train, two locomotives and the spare coaches were obtained."

Since this description was written, the line has been closed owing to the enlistment of the owner in the R.A.F. Further developments were to have included the doubling of the track, and automatic signalling.

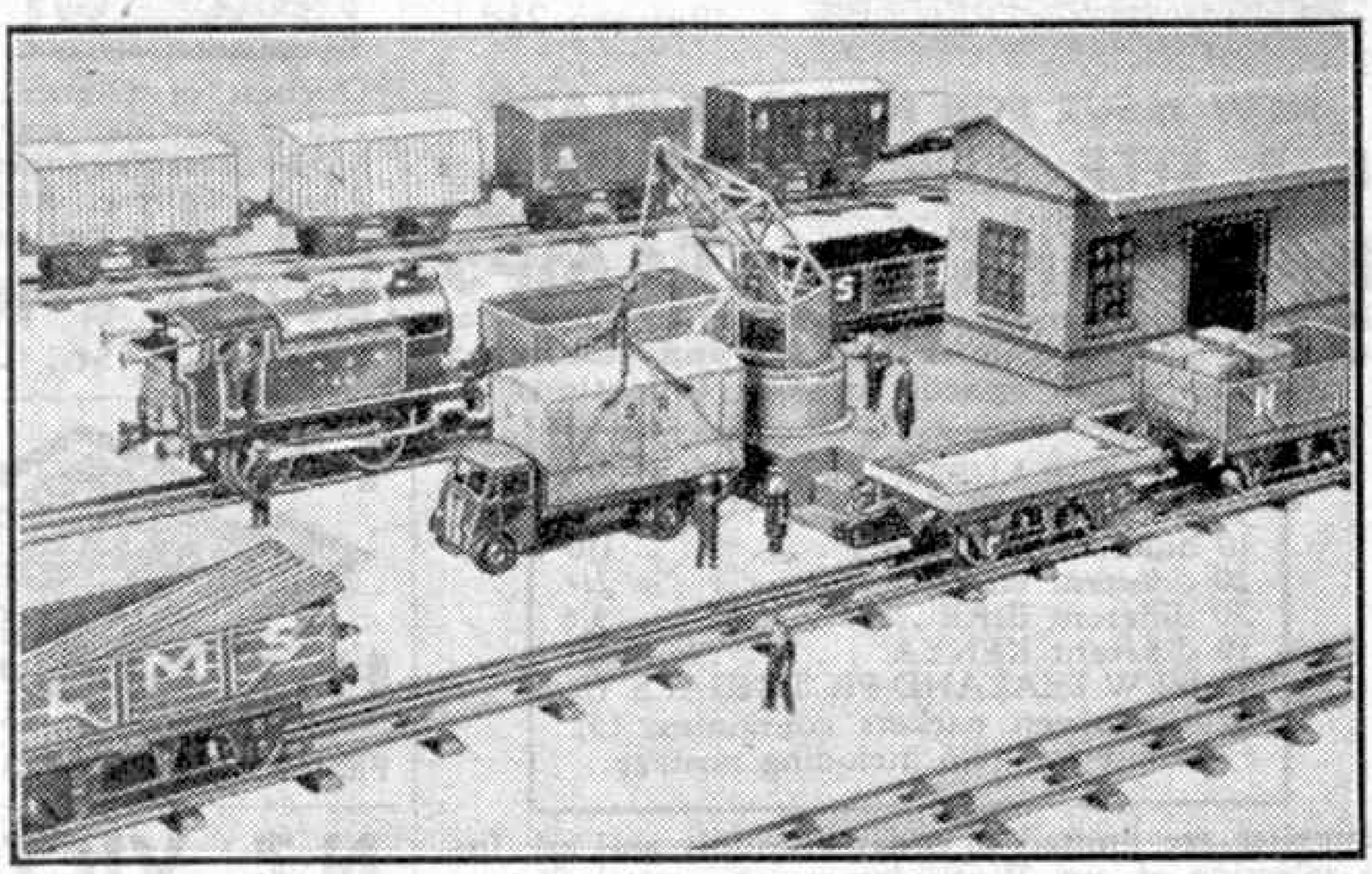


The Hornby-Dublo "South Essex Railway" of Mr. A. E. Clark, Rainham, described on this page.

Goods Yard Working on Hornby Railways

GOODS trains play an interesting part in the operations on a miniature railway system. Apart from the variety of stock employed, the provision of loads for our wagons adds considerably to the fun of train working. Matchboxes, small bobbins and many similar oddments that can be found at home will make quite good loads of various kinds.

The actual handling of the loads in the goods yard can be quite fascinating. A standard platform or yard crane is just what we require to move the loads into or out of our wagons. Alternatively, we can make up a simple crane, either of the fixed or mobile type, from Meccano parts. In any miniature yard the mobile type of crane will have advantages and will reduce the amount of shunting to be done simply because of its ability to move up to practically any vehicle as required. Those who have more elaborate systems including a goods yard, can install an effective gantry crane spanning the yard tracks.



A realistic yard scene on a Hornby layout. The platform crane is about to lift the container from the Dinky Supertoy "Guy" Flat Truck.

Some loads are naturally adapted for lifting by the crane hook; others will need to be "roped-up" for attachment to the hook, or will require a sling of Meccano Cord or thin flexible string to permit them to be lifted. Devising suitable slings for different purposes can be quite interesting.

The working of the wagons into particular places in the sidings will sometimes make interesting shunting movements necessary. Then there is the reverse operation of assembling the wagons together to form a train. This is made easy by the automatic couplings with which Hornby rolling stock is fitted; the couplings engage one another when the vehicles are pushed together by the engine.

Nowadays, motor vehicles play a prominent part in the working of a goods yard, either in railway collection and delivery services or in the service of private traders. On a Hornby, or in fact any miniature railway, corresponding attention should be given to the road services and traffic, and for this purpose many of the Meccano Dinky Toys are ideal. For instance, the Mechanical Horse and Open Wagon, and the Royal Mail Van, Dinky Toys Nos. 33w and 34b respectively, always look well about the station or yard, while any of the larger models of various types will help to swell the volume of general road traffic.

The introduction of the Dinky Supertoys has been of special interest and importance to Gauge 0 railway owners, as the size of these models makes them very suitable for use on and about their layouts. The three "Guy" vehicles, Flat Truck, Flat Truck with Tailboard and the Lorry are particularly good for local road services.

Our picture shows what a busy goods yard on a Hornby railway can look like. The main interest is centred on the goods platform where the wagons can be loaded or unloaded by means of the crane. The crane in the picture is about to lift a goods container from the deck of a Supertoy "Guy" Flat Truck, and transfer it to the railway wagon waiting alongside. One of the Open Wagons on the near track carries Meccano Rods; the other wagon by the goods platform, is partly loaded with bales made with brown paper, "roped" with thin string. The miniature figures such as the shunter in the foreground, the engine driver and the group about the platform crane, all add considerably to the realism of the scene.

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For other Stamp Advertisements see also pages 66 and vii.

Stamp Collecting

Our British Commemoratives

By F. Riley, B.Sc.

THIS year we are to have three British commemorative issues. Of those one is to mark the Silver Wedding of the King and Queen, and will consist of two stamps, of values 2½d. and £1 respectively. A second set will comprise two stamps to celebrate the anniversary of the liberation of the Channel Islands from German occupation; and the third, probably of four values, will commemorate the holding of the Olympic Games in this country. These issues will appear in April, May and July respectively.

The announcement that these special stamps were to be issued came as a pleasant surprise to the great army of stamp collectors, who had been disappointed to find that a mere postmark, which in itself had no special distinction, was the only memento of Princess Elizabeth's wedding. Yet after all, this was not unexpected, for British stamps are unique in that they have been almost entirely restricted to the simple purpose for which they were introduced in 1840, and commemoratives of any kind have been very rare indeed.

The beginning of our very slender commemorative history came in 1890, when a special card was issued to celebrate the Jubilee of the introduction of Penny Postage. The card also commemorated the Jubilee of the postage stamp. It was sold for 6d., although the actual postage charged for its transmission through the mails in an envelope was only 1d., and the surplus was used for a fund for postal servants. The custom of issuing commemorative and charity stamps now so largely followed in practically every country in the world has been traced back to the appearance of this card, so that here, as well as in the introduction of the adhesive stamp itself, Great Britain can claim pioneering rights.

For a further British commemorative outbreak we had to wait until 1924. It took the form this time of an actual stamp, issued to mark the British Empire Exhibition opened at Wembley in that year, and it was followed in the second year of the Exhibition by a similar stamp with the date altered from 1924 to 1925. The stamp was of unusual size and shape for a low value, but its design was not particularly attractive in the pictorial sense. As was customary with British stamps, the head of the King and the Crown were included, and the lion that is the only other prominent feature was the symbol adopted for the Exhibition itself.

Collectors who bought Wembley Lion stamps of 1925, which were issued in smaller numbers than those of 1924, have found their purchases increasing steadily in value ever since.

The next British commemoratives came in 1929, a year in which a Congress of the Universal Postal Union was held in this country. Different countries in turn were the hosts of this Congress, and it became customary for the country concerned to issue commemorative stamps to mark the occasion. When the 9th Congress of 1929 brought such an opportunity to Britain it was taken in a somewhat half-hearted fashion. Special stamps were printed, one of which appears on this page, but the designs were decidedly uninspired, and apart from the inclusion in them of the words "*Postal Union Congress London,*" the stamps were on the usual dull lines that had marked British issues for many years before this issue. The £1 value was to some extent an exception. It was a large one, with the usual head of the King and Crown upon it, but the rest of the design showed St. George slaying the dragon in a very fine and spirited pictorial version of the well-known legend.

There was a further wait of six years for the next commemorative, the Silver Jubilee of 1935. The pace then quickened, judged by British standards, for in the following year came the Coronation stamp, and only four years later the centenary of the Penny Black was celebrated by a special issue in six values, from ½d. to 3d., with the same design in different colours. Then came the Victory stamps of 1946, which will be fresh in the memory of my readers.

It is interesting to spread out these British commemorative stamps and to realise how tradition has been followed in their production. Every one bears the head of the King, with that of a Queen added in two instances. None of them includes the name of the country; and certainly not one can be described as a work of art, calculated to arouse admiration for its design. When we compare them with commemoratives of other countries, or with the wonderful pictorial issues of our own Commonwealth stamps, they provoke a sense of disappointment. Excellent opportunities of producing something really striking that would have given pleasure to stamp collectors, at home and abroad, have been thrown away on these occasions and also on others that have been passed by without any recognition.

Let us hope for better things from the commemoratives of 1948. The finest stamps in the world can be printed in Great Britain and we should have for them ideas and designs that will make them worthy to be placed alongside the finest commemoratives that have appeared anywhere. We can assume that the stamps will be placed on general sale for a period, and will be for genuine postal use, so that they will be acceptable additions to our collections.

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For other Stamp Advertisements see also pages 64 and vii.

Stamp Gossip
and Notes on New Issues

By F. E. Metcalfe

THE writer of these notes has just finished a three months' trip to Central Europe, and it has been interesting to see collectors of other countries busy with the stamps which interest them, or rather, how they manage to enjoy the only issues they are able to obtain. These are generally the various new sets which are emitted so frequently by their own governments.

Those of us who live outside these countries are apt to criticise their numerous issues, but collectors who are not able to get any new stamps, except those of their own land, are anything but displeased at the enterprise of the Post Offices, and if we were similarly situated we would probably feel the same way. As it is, we can obtain new stamps in abundance from our Commonwealth, and as these stamps happen to be so beautiful we have very little to complain about in these days of shortages.

Not many of our King George VI issues are to be seen in countries like Hungary, but that is not the fault of the collectors there. They would be glad enough to collect them, were they able to do so. An American staying in the same hotel as the writer had a collection of these stamps. They were hopelessly mounted, and a Hungarian friend undertook to make them worth looking at. The result was an education as to the importance of one taking pains when making a collection.

All that the Hungarian could obtain were some sheets of plain paper, which were cut to fit a loose-leaf binder, which had originally been intended for anything but stamps. The various sets were all carefully set out, one to a page. The only writing-up was the name of the country, the date of issue, and a neat little map of the country concerned at the left top corner of each sheet. The American was charmed, as he had every right to be, and the murmurs of admiration which came from other Hungarian collectors when they saw the result showed clearly how they would like to collect our Commonwealth stamps were they available.

Things are moving fast in the East and with countries like Burma now definitely out of the Empire, the question of keeping the new stamps of this country, and of others similarly situated, such as Transjordan, etc., in Part 1 of Gibbons' catalogue will have to be considered seriously.

The whole world looks upon Gibbons' catalogue as the standard for British Commonwealth stamps. These stamps are exceedingly popular everywhere, particularly the issues of the present reign, and this popularity means that the various countries in the Commonwealth derive substantial revenue from them. It is true that these current stamps are, in the main, exceedingly beautiful, but so are the modern stamps of Europe, yet they are thought very little of on the whole, outside their respective countries, owing to the fact that new issues are being brought out with far too great a frequency. If our own colonies adopted the same methods, they too would very soon lose their appeal. Now it is quite evident that the countries which are leaving the Commonwealth are intent on bringing out new sets all the time, and this will bring into ill favour countries associated with them. In other words if Gibbons continue to keep these stamps in the same volume of their catalogue as the rest of the Commonwealth issues, collectors will in most cases overlook the fact that Burma, etc., are no longer in the Commonwealth, and seeing so many new stamps, will cease to maintain their old partiality. Our stamps will then be thought no more of than the "New Europe" issues. It is to be hoped that Gibbons will act promptly, and relegate to Part II all new sets of stamps which are issued by countries which have left us.

This is being written some time before it will appear in print, but at the time of writing, one or two values of the "Cypher" overprints of North Borneo have appeared, and these are difficult to obtain. Dealers with more enterprise than judgment offered the set complete, at a fraction over face, expecting, of course, that the Crown Agents would be releasing supplies in London. There were some blue looks when it was learned that all had been sent to the Colony, owing to short supplies of various values. Certain influential members of the stamp trade protested strongly to the Colonial Office, and it would now appear that their protests are likely to bear fruit, and that another printing is on order. By the time these notes come to be read, there may be confirmation of this, but in any event readers will be wise not to pay fancy prices for the set, until something more is known about it.

We cannot leave the U.S.A. out too long, so this month we are illustrating the "Old Ironsides" commemorative. The stamp will be popular enough, as all "ship" stamps are, but the fact that the stamp was issued at all just goes to show how difficult these new countries find it to be able to raise historical events worth commemorating. Anyhow they have used a new shade for a 3c. stamp, if nothing else, and the result is quite pleasing.

The "Life Insurance Department" "Lighthouse" stamps of New Zealand, continue to be best sellers, which shows how important the design of a stamp is, as far as the selling of it is concerned. The previous set could hardly be given away, for the stamps themselves were poor looking little things. It is this set which is our strong tip for the month. Gibbons have now listed the old set in the Mult. N.Z. and Star watermark. The 1d. value came out in this paper, in 1945, but just before the appearance of the "Lighthouse" set, the other values ½d. to 6d. also were issued in the current watermark. There cannot be many of these stamps about, and if you can obtain a set at Gibbons' price of 2/5 do not hesitate to buy, for one gets few chances at such snips. These stamps are becoming quite popular, for reason given, and not many Commonwealth issues have a life of only a week or two. We are illustrating one of the stamps you should buy, but see that it has the multiple watermark.

A SWISS MODEL RAILWAY

"I was most interested in the article by W. J. Bassett-Lowke, entitled '*Model-Making in Switzerland*,' in the March 1947 '*M.M.*' It was, therefore, in the capacity of a model enthusiast that one of my first excursions on reaching Lucerne was to visit the Brast Brothers' Railway at Horw.

"I arrived at their site, a total stranger, armed with the '*M.M.*,' March edition, and with its aid made my interest understood. The eldest brother Mr. Walter Brast, who speaks English fluently, then took me under his wing, and, after having showed me round, gave me the freedom of the site and allowed me to take as many pictures as I had spools to fill.

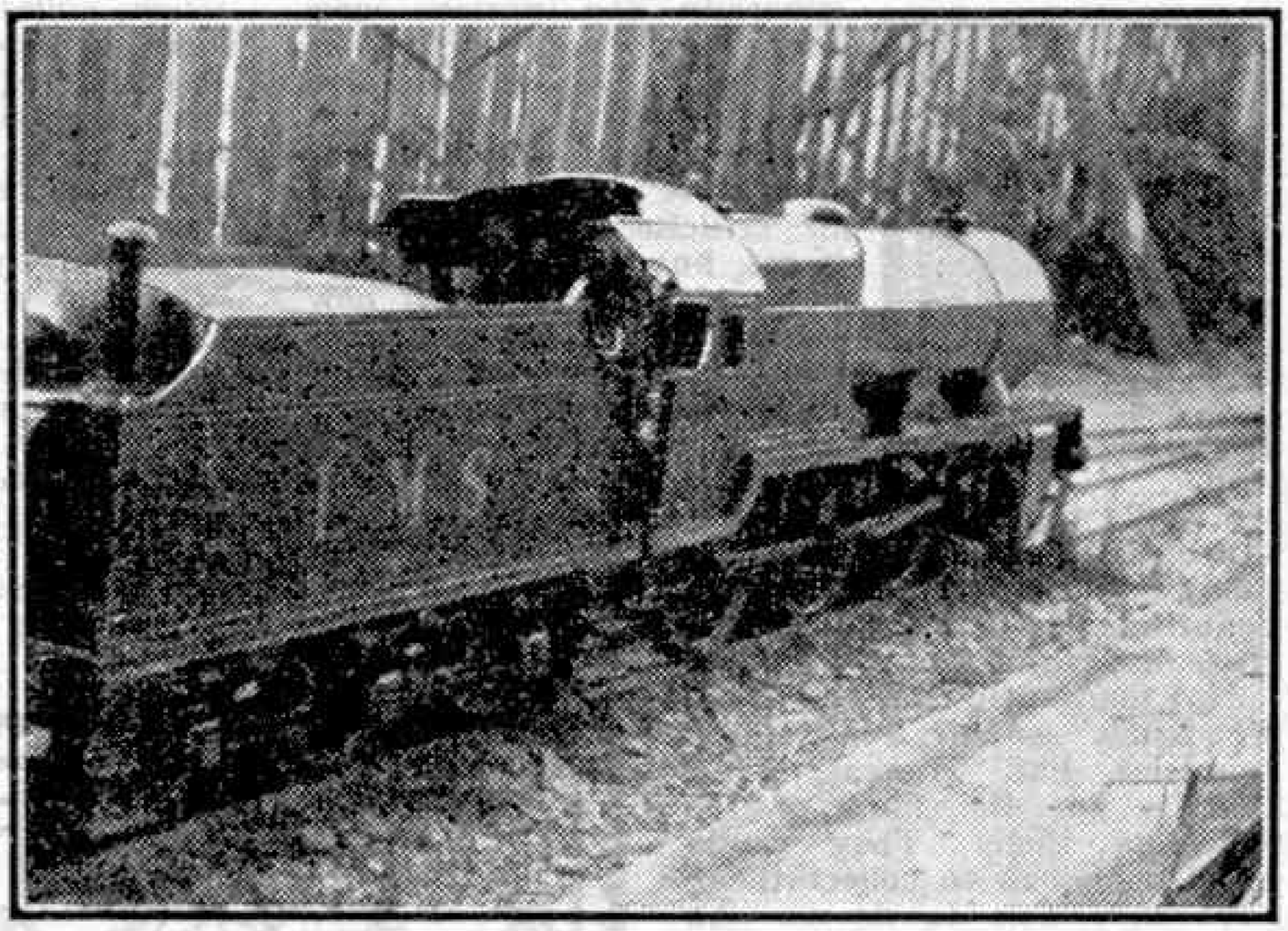
"At the end of one of the most enjoyable afternoons I have ever spent, I received a very kind invitation to spend a day with Mr. Walter Brast at his home in Brugge, about 40 miles from Zurich. In his large garden he has a very creditable track, with bridges, stations, sidings, etc., and when the engines are there his entire family take turns at being engine drivers. When these operations are in progress it is impossible to keep the local children on the right side of the fence, and it was this that persuaded him to open his 'Happy Acre' at Horw.

"Mr. Brast's next conquest is to learn the Gaelic language, and I have managed in some small way to repay him for his hospitality by sending him a Gaelic and English Dictionary.

"Before leaving Switzerland I again visited Horw, and was privileged to be allowed to drive the 'Royal Scot,' pulling a good load of passengers.

"I left Horw with the joyous laughter and the happy shouts of the children ringing in my ears; with thanks to my hospitable Swiss hosts on my lips, and a wish in my heart, that, wherever there are children may someone like the Brast Brothers be with them, sharing their hobby, their pleasure, and their fun."

J. GARDNER (Glasgow E.2).



Miniature of L.M.S. No. 6100 "Royal Scot" on the Brast Brothers' model railway at Horw, Switzerland, referred to on this page. Photograph by J. Gardner, Glasgow E.2.

Oil for Britain—(*Continued from page 44*)

kerosene are pumped to storage; some of the gas oil, however, is returned to the tower as reflux.

Three sidestreams are withdrawn from the tower as shown. These are the materials from which lubricating oils are manufactured and hence are termed "lubes" 1, 2 and 3 (see Fig. 1). The lube oil sidestreams flow by gravity into *strippers*—miniature fractionating towers—where any remaining light ends are vapourised by superheated steam, the vapours being returned to the tower. The stripped lube oil distillates are pumped to run-down tanks and then to storage.

(*To be continued*)

Tramps of the Air—(*Continued from page 52*)

Britain, as described in the June 1947 "*M.M.*," London Aero and Motor Services recently tramped one of their "Halifaxes" round the world, picking up cargoes *en route*. And what cargoes!—everything from empty beer bottles and machinery to seven tons of dripping. Rather surprisingly, the "Halifax" has proved a very efficient air freighter, carrying seven tons of cargo for 900 miles at speeds of about 200 m.p.h. But there is obviously scope for a specialised cargo-plane in this category, to supersede the "Halifax," and the giant new "Universal Freighter" being built by General Aircraft may be the answer.

The Americans, perhaps because of a preference for "glamour," have got off to a very late start in producing specialised air freighters, and about the only example to date is the Northrop "Pioneer," a good illustration of which appears on page 52. It was designed with the emphasis on cheap operating costs, sturdy construction and ability to operate from small fields, and promises to be a very useful machine. Three 800 h.p. engines ensure good performance and reliability and the "Pioneer" can take off in only 700 ft. with a 4½-ton payload. It is rather more streamlined than its British counterparts, with a corresponding reduction in ease of loading, but improved handling characteristics in a cross wind. It should prove an ideal replacement for the "Dakota" freighter on American internal airlines.

It is significant that, at this time when restrictions on foreign travel are having a serious effect on British passenger airlines, air freight-carrying is enjoying a boom. The accent is on export, and loads range from giant ship's propellers to race-horses and fountain pens. So, for a few years at least, there seems a bigger future for the aerial tramp ship than for the sleek new passenger-carrying air liners now taking shape in our factories. A well-known air journalist once described the Bristol "Brabazon" and "Freighter" as, respectively, "Beauty and the Beast." At the moment it looks as if the Beast has the laugh over Beauty!

COMPETITION RESULTS

HOME

SEPTEMBER 1947 LOCOMOTIVE PARTS CONTEST

1st Prize: P. M. Edwards, Crewe. 2nd Prize: D. Hewison, Bramley, Leeds. 3rd Prize: C. E. Wrayford, Bovey Tracey. Consolation Prizes: D. W. Field, Birmingham 22B; D. Goodall, Wakefield; D. Bradford, Uppingham; C. H. Beecroft, Sheffield 2.

SEPTEMBER 1947 STAMP BARGAIN CONTEST

1st Prize: B. Rummery, St. Leonards. 2nd Prize: B. M. Souter-Smith, Grimsby. 3rd Prize: J. B. Naylor, Horsforth. Consolation Prizes: L. Bern, Portsmouth; J. Bryden, Ayr, Scotland.

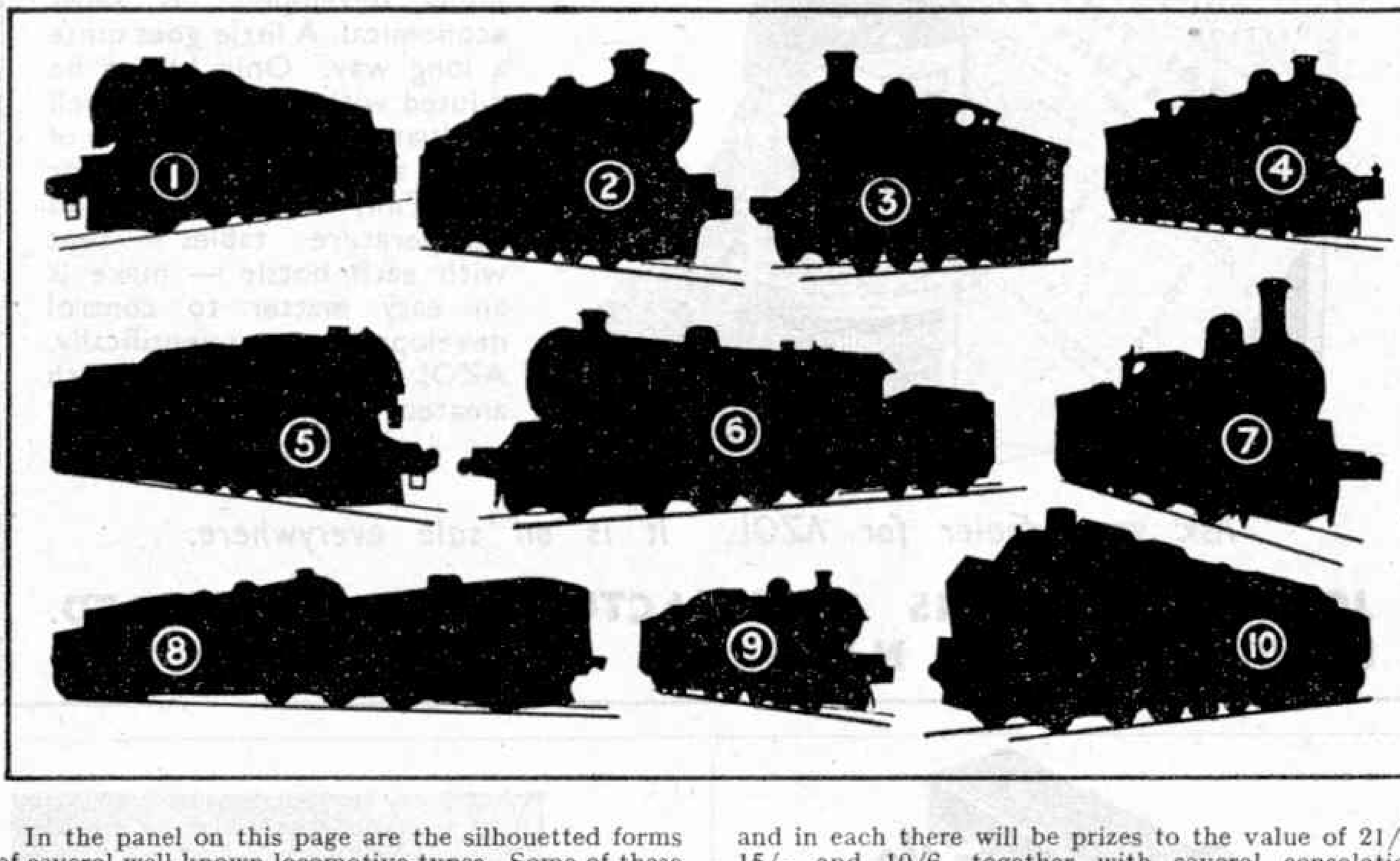
SEPTEMBER 1947 PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. Duffy, Portumna, Co. Galway; Section B: R. E. Morris, Swanage. 2nd Prize, Section A: P. F. Chapman, St. Leonards-on-Sea; Section B: S. Kyle, Leighton Buzzard. 3rd Prize, Section A: F. E. Quenby, Nottingham; Section B: A. E. Moat, London N.9. Consolation Prizes, Section A: A. W. Fantham, Wendover; J. T. Wood, Sheffield 2; R. Forsey, Nottingham; S. L. Connors, New Malden Section B: D. J. Hards, Welwyn Garden City.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Locomotive Shadows



In the panel on this page are the silhouetted forms of several well-known locomotive types. Some of these will be recognised fairly easily; others will take a little more study to determine. Readers are asked to make a list of the locomotives represented by these silhouettes in numerical order, stating the class and wheel arrangement, with the name of the owning railway and pre-grouping owner, if any.

The contest will be divided into the usual two sections, for Home and Overseas readers respectively, and in each there will be prizes to the value of 21/-, 15/- and 10/6, together with several consolation prizes for other good efforts. In the event of a tie for any prize the judges will take neatness and originality into consideration.

Envelopes containing entries should be addressed to *"February Locomotive Shadows Contest, Meccano Magazine, Binns Road, Liverpool 13."* The closing date in the Home Section will be 31st March and that for Overseas 30th September.

Figure Drawing Novelties

For our second competition this month we have a Figure Drawing Contest, a type that has proved very attractive to readers in the past, but has not figured in our pages for many years.

The idea of the competition is very simple. All that entrants have to do is to send in a drawing in which the outlines, details and shading are all indicated by figures. In other words, every line in the drawing must be one of the numerals 1 to 9, and 0 can be included if desired. It will be seen that here is a splendid opportunity for *"M.M."* readers to exercise their skill and ingenuity, and they will find that it is really good fun to see what they can do with figures.

There are no restrictions beyond the necessity for using the numerals indicated to make up the drawing. Competitors may choose as their subjects animals, scenes, locomotives, buses, aeroplanes—in fact anything that seems to them to provide the best opportunity for figure drawing. Each figure in the completed drawing must be clear and distinct, but it can be laid on its side or even placed upside down in order to suit the requirements of the drawing.

As usual, there are two sections, for Home and Overseas readers respectively, and in each there will be prizes of 21/-, 15/- and 10/6 for the best entries in order of merit, with additional awards of 2/6 each for other deserving efforts. Entries should be addressed *"February Figure Drawing Contest, Meccano Magazine, Binns Road, Liverpool 13."* The closing dates are 31st March in the Home Section and 30th September in the Overseas Section.

February Photographic Contest

This month's photographic contest is the 2nd of our 1948 series, and in it, as usual, prizes are offered for the best photographs of any kind submitted. There are two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of the print must be stated exactly what the photograph represents. A fancy title may be added if desired.

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16. They should be addressed *"February Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13."* There will be separate sections for Overseas readers, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Closing dates: Home Section, 28th February; Overseas Section, 31st August.

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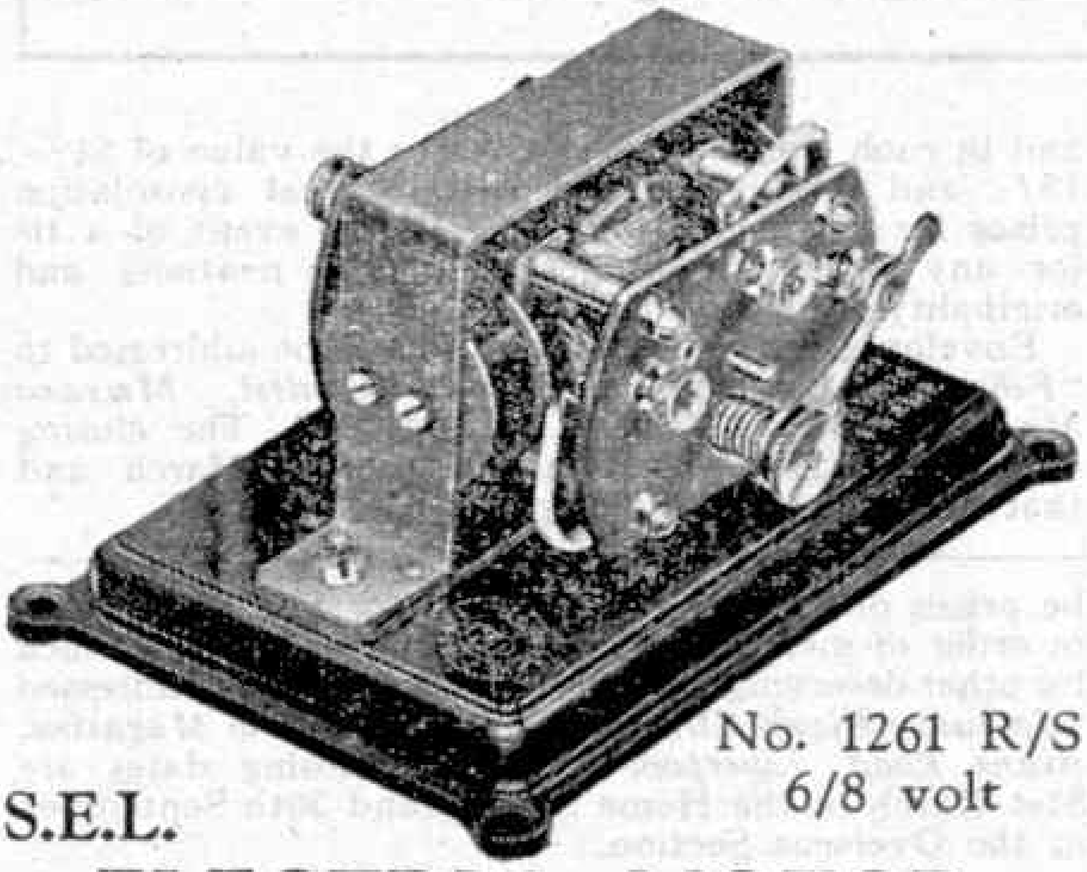

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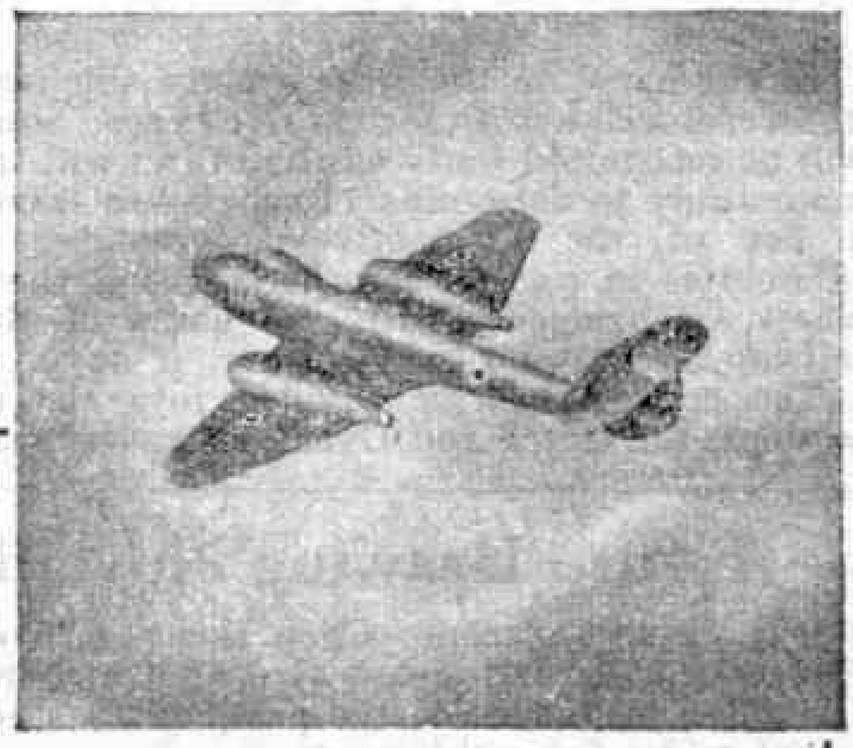

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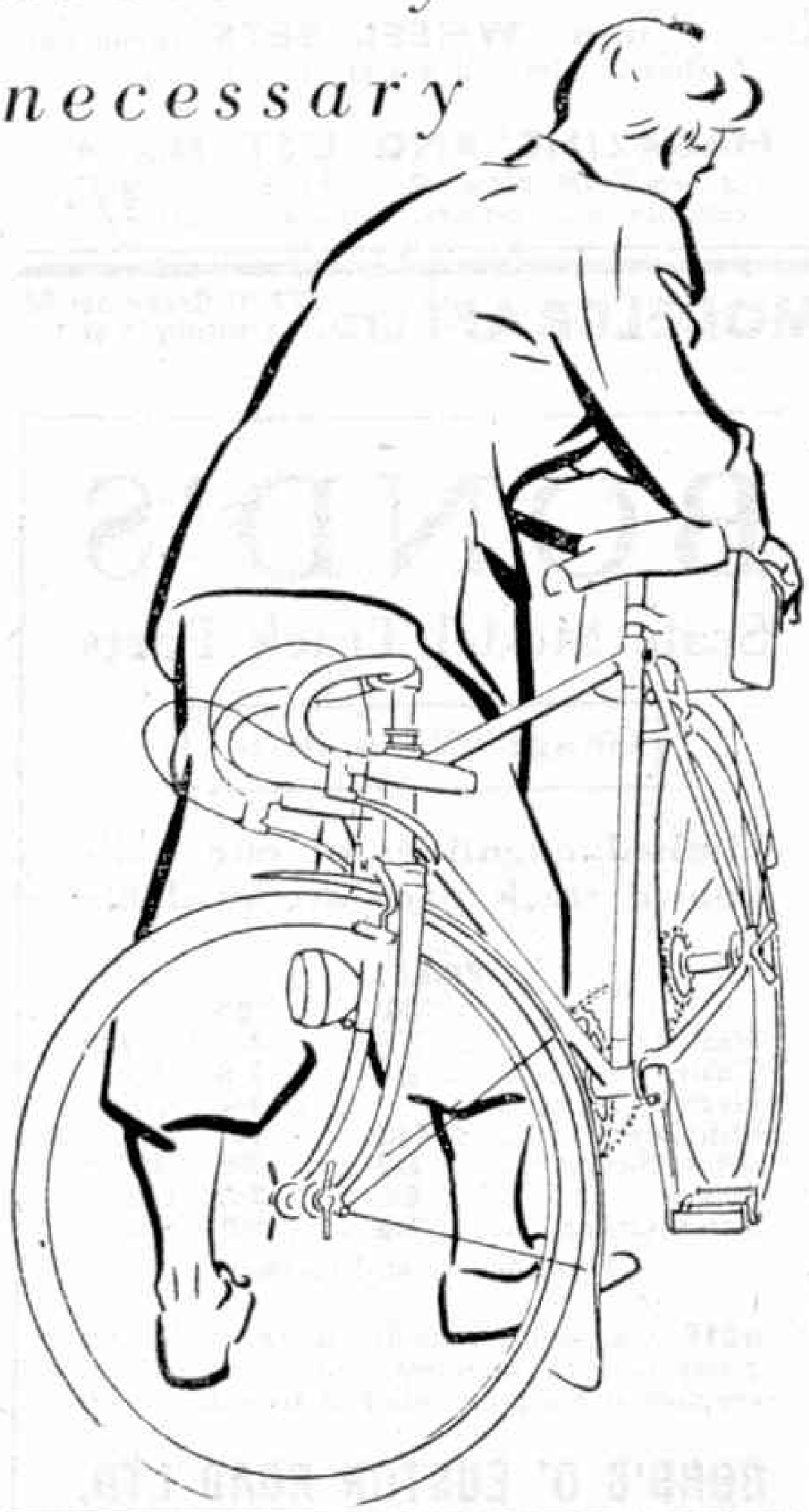

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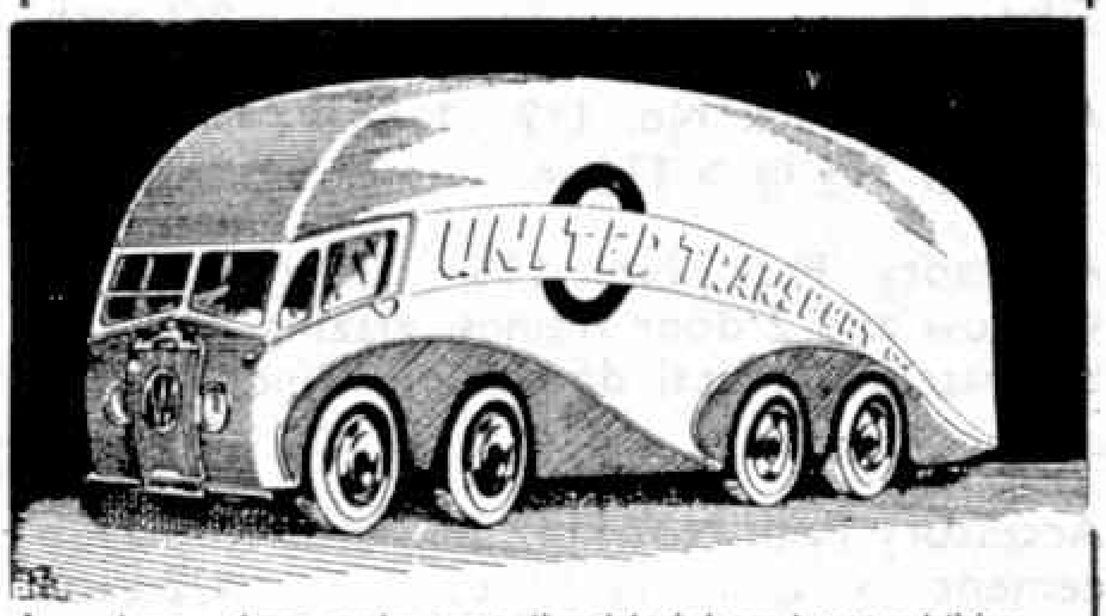

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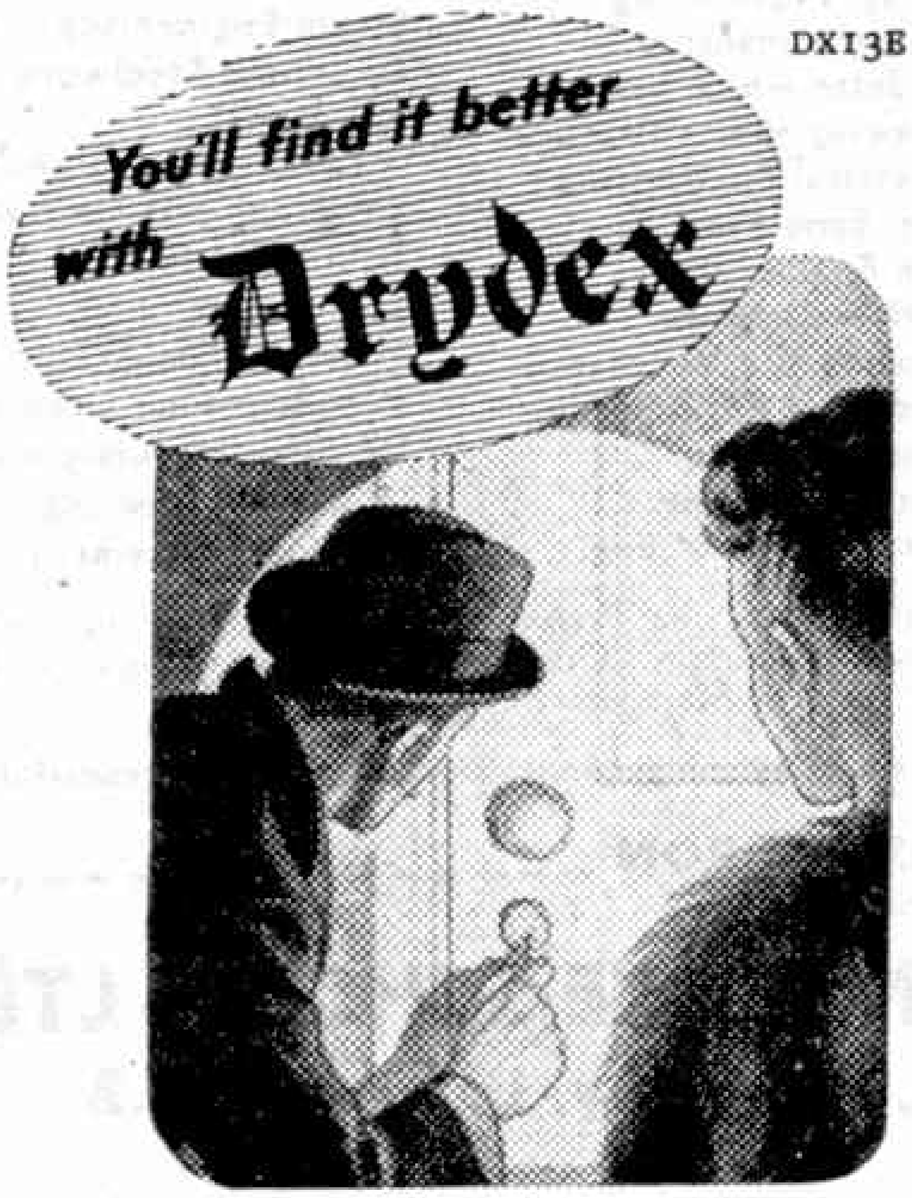

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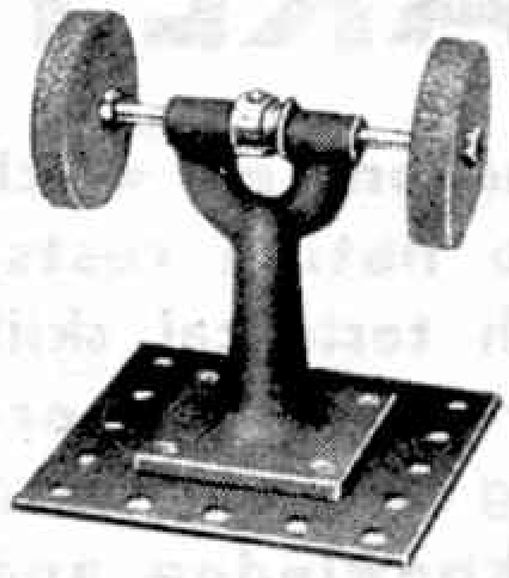

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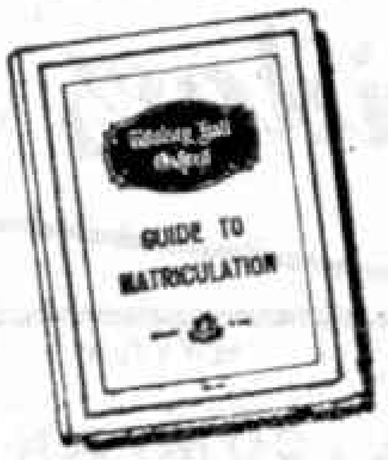

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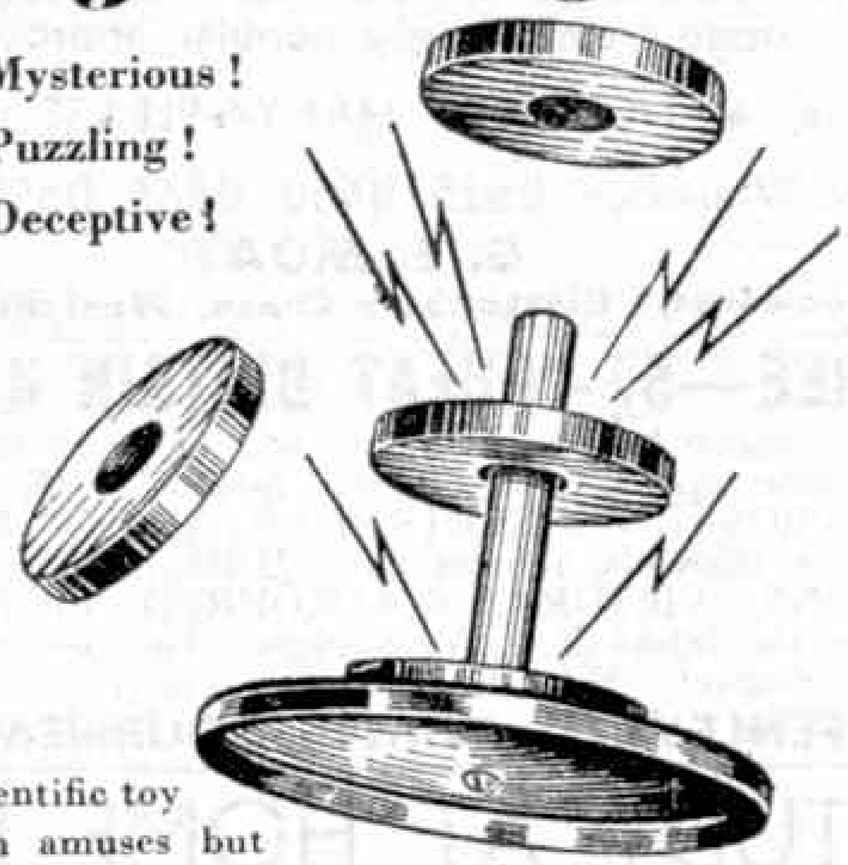

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"Scout" Magazines, February 1943–March 1947 (four missing), 15/–.—8, St. John's Avenue, Chaddesden, Derby.

Electric Gauge 0 Railway Bassett-Lowke *Royal Scot* Engine, Tracks, Trucks, Station, etc.; bought Walkers & Holzapffel, May 1947; £35.—103, Rossmore Court, London N.W.1. Paddington 1316.

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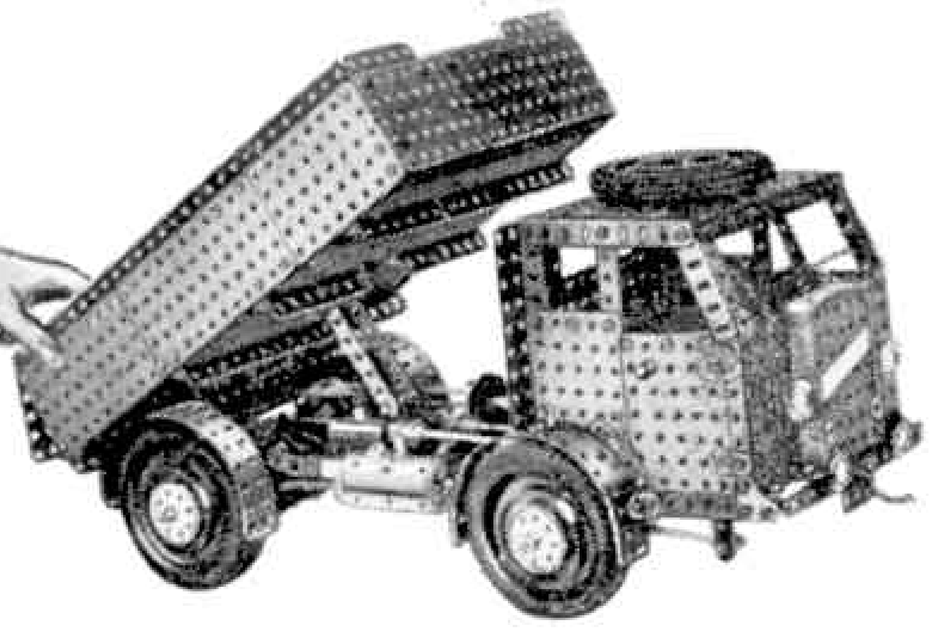

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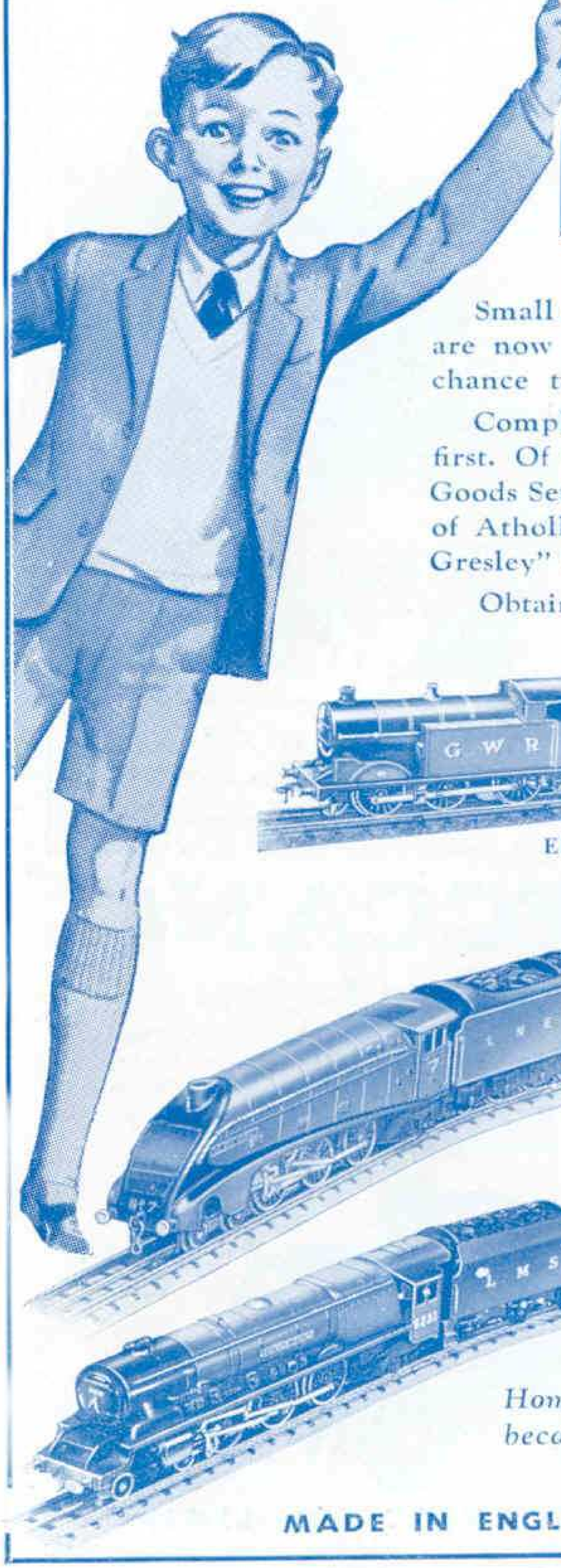

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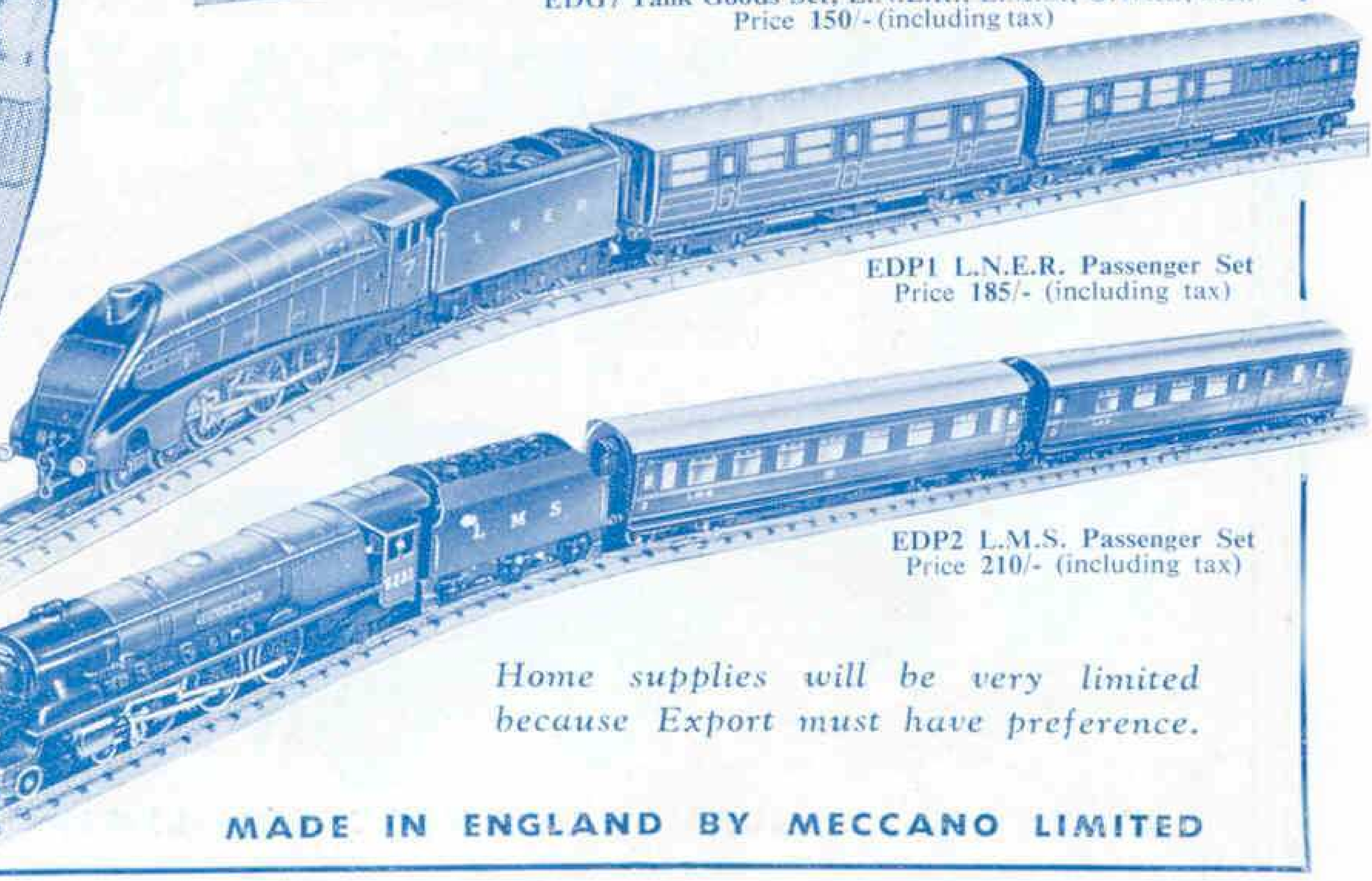

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